WASHINGTON NEWS

Aged Health Issue
Oral Vaccine
Birth Control
Miscellany

NIXON HITS KENNEDY STAND ON AGED HEALTH CARE

Vice President Richard Nixon attacked Sen John Kennedy s endorsement of the compulsory social security approach to health care of the aged, asserting that no one in America who does not want health insurance should be forced to have it against his will "

The GOP presidential candidate emphasized that citizens should be free to make their choice

The Social Security health plan of Kennedy would compel all people who have Social Security to have health insurance," declared Nixon

Meanwhile, the U S Chamber of Commerce urged business firms voluntarily to make group health insurance coverage available to all employees during their retirement years Former employees as well as present workers should be offered coverage, the Chamber said

Pointing out that rapidly growing private health insurance plans now cover half of America's 16 million aged persons, the Chamber said it supports growth of private, voluntary plans "Federal socialized medicine would be harmful," the Chamber said

Employers were told by the Chamber that "the economic well-being of your retired worker should be of concern to you And, as you know, nothing can destroy the morale of a retired person living on a fixed pension quicker than a serious illness that wipes out his savings and leaves him disgruntled and bitter in his old age'

ORALLY ADMINISTERED POLIO VACCINE MAY BE YEAR OFF

Orally administered polio vaccine probably will not be available for widespread public use until after the polio season of next year, the Public Health Service predicted, urging a stepped-up effort to promote wider use of the Salk vaccine 'which has brought about dramatic reductions in the incidence of poliomyelitis during the past five years'

The statement was made by the PHS following a 2-day meeting of the Agenda Committee of the Committee on Poliomyelitis Control at the PHS's Communicable Disease Center, Atlanta The committee is an advisory group of representatives of the medical and public health professions and of the general public

The PHS last summer said it would license an orally-administered live polio virus vaccine for the U S in the near future

The number of paralytic polio cases reported for the first 9 months of this year totaled 1,553 compared with 4,050 for the same period a year ago Of the 1960 paralytic cases, over 56 per cent had received no polio vaccine and 77 per cent had not been vaccinated with 3 or more shots

COURT TAKES BIRTH CONTROL CASE

The Supreme Court agreed to rule on a Connecticut law which makes it illegal for anyone to use contraceptives or for a physician to prescribe them The case was brought to the Court by Dr C Lee Buxton, a gynecologist and professor of obstetrics at Yale University, and by a married couple and housewife, not identified

Dr Buxton said he wanted to advise the women about 'medical instruments" to prevent conception, but was unable to do so because of an 1879 state statute State Courts upheld the law One of the 2 women involved had survived a pregnancy with serious emotional and physical impairments, the other wife had 3 children with congenital abnormalities

MISCELLANY

A team of 6 American scientists is visiting Russia to survey progress in the field of maternal and child care in the Soviet Union The 30-day mission, sponsored by the National Institute of Neurological Diseases and Blindness, is part of a scientific-cultural exchange program between the United States and the Soviet Union A group of Russian specialists will make a similar study of maternal and child care in this country at a later date

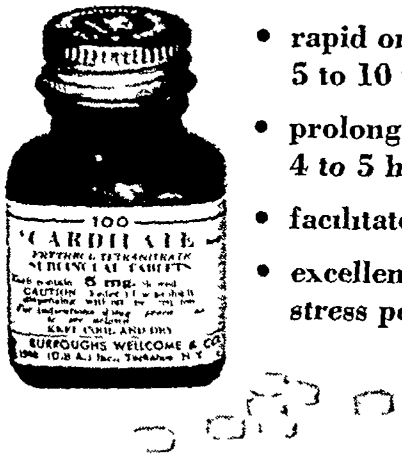
A smog alert network is being established in 36 states east of the Mississippi The Public Health Service-Weather Bureau project will alert local

(Continued on next page)

a new strength of 'CARDILATE'

brand Erythrol Tetranitrate

sublingual tablets for angina pectoris



- **rapid onset of action — 5 to 10 minutes**
- **prolonged duration of effect — 4 to 5 hours**
- **facilitates adjustment of dosage**
- **excellent for stress period therapy**

5 mg.

Particularly for angina patients who require only 5 to 10 mg of erythrol tetranitrate per dose, the new 5 mg 'Cardilate' tablets permit maximum flexibility of therapy adjustment Whatever the individual requirement, patients may experience as much as 4 or 5 hours of freedom from anginal pain with each dose of 'Cardilate'

"Nitroglycerin and erythrol tetranitrate when administered sublingually are among the most effective of all prophylactic agents available for the treatment of patients with angina pectoris The comparatively prolonged duration of action of erythrol tetranitrate makes it especially valuable for clinical use."

Riseman, J E F., *et al*. Circulation 17 22 (Jan) 1958

'CARDILATE' brand Erythrol Tetranitrate
Sublingual Tablets of 5 mg and 15 mg scored

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, New York

weather stations from a weather research station at the PHS's Sanitary Engineering Center, Cincinnati "Atmospheric pollution over cities tends to intensify in the fall, when conditions of high pressure and low wind are most frequent," said a PHS official

Victims of cancer and heart ailments may be treated in a hospital placed in orbit around the earth some day The House Space Committee, in a report on life sciences and space, said that "the possible therapeutic effects of weightlessness are still to be explored" The committee said, "it is not inconceivable that in time some types of coronary cases will find relief by being sent to a space station in free fall around the earth" Concerning cancer victims, the report said that perhaps "some ingredient in the spectrum of radiation reaching a space ship would be helpful if the patient were sent up to a space station for therapy

The Public Health Service reported that 2,036 research grants and 273 fellowships totaling $38,120,960 were awarded by the National Institutes of Health during September, 1960 Of the total, $10,609,084 was allocated to support 620 new research grants and fellowship awards The remaining $27,511,876 was for the continuation of 1,544 previously approved research grants totaling $26,966,040 and the continuation of 145 fellowships totaling $545,836,

The National Council on the Aging, a nonprofit organization to serve the needs of older persons, will be formally launched on January 1 The Council grew out of The National Committee on the Aging which has been a standing committee of the National Social Welfare Assembly since 1950 The Committee has received two appropriations from the Ford Foundation—the first for $500,000 in 1956, the second for $750,000 in 1959 The National Council on the Aging will represent the many areas concerned with older persons Business and industry, organized labor, government, the health professions, education, housing, research, the clergy, social work, and local communities will be members of the Council The Council's aims include the stimulation of constructive action for meeting the needs of older persons and providing opportunities for their continued independence and constructive participation in the life of the community Encouragement and assistance will be given to industry labor, welfare groups, government agencies, old age homes, colleges, hospitals, religious groups, and others interested in older persons to expand their efforts in the field

The Public Health Service reports Americans suffer about 115 3 million colds during a "normal" year according to a nationwide sampling of 37,000 homes conducted during year ending June, 1959 Twenty-seven million one hundred thousand cases of other "acute upper respiratory conditions" were reported, which include sore throats and infections of the sinuses, tonsils, voice box, and windpipe In an ordinary year common colds cost Americans

39.5 million days of work and more than 64 million days of school. As for "lower respiratory infections" the ordinary year's toll is 73 million cases, including 59.3 million cases of influenza and pleurisy, 8.5 million cases of "intestinal flu," 2.7 million cases of bronchitis, and 2.5 million cases of pneumonia. More than 20 million cases a year are simply blamed on "the virus."

For the fifth year in a row, the number of disabled persons prepared for and placed in employment through the state-federal program of vocational rehabilitation set a new record—88,275 persons in fiscal year 1960. Complete reports from the states and island possessions showed a gain of 9 per cent over the year before, when rehabilitations numbered 80,720.

The National Institute of Mental Health provided a $270,000 grant to George Washington University to start a 3-year study to find out what causes chronic traffic violations. The study is aimed at finding out what driver attitudes are common among poor drivers and how counseling and education might improve the sitaution. District of Columbia motorists with bad safety records will be used in the investigation.

The Food and Drug Administration warned druggists to be alert for suspicious drug marketing practices which may indicate the marketing of counterfeit drugs. The retailer should insist upon receiving his drugs only in original, sealed manufacturer's packaging, the agency cautioned. FDA urged drug retailers to report promptly whenever they are offered special deals under suspicious circumstances.

The Food and Drug Administration announced it has set temporary tolerances for the use of nine previously-banned coal-tar colors used in drugs and cosmetics, especially lipstick. The FDA took the action in compliance with the color additives amendment to the Federal Food Drug and Cosmetic Act passed by the last session of Congress. The new law permits the agency to set limits for the use of certain colors which are poisonous when consumed in large quantities.

Over-the-counter sales of tablets or crystals of potassium permanganate were barred by the Food and Drug Administration as a result of reports of increasing misuse of the drug by women in dangerous attempted abortions. Druggists may only sell the drug by prescription after Oct. 23 under the agency's ruling. The drug does cause abortions, but can result in serious burns if not used correctly. Labels on potassium permanganate henceforth must state "Warning—for external use on the skin only. Severe injury may result from use internally or as a douche. Avoid contact with mucous membranes."

The government estimated 4,203,000 babies will be born this year, 2 per cent below the 4,282,000 born last year. The Public Health Service viewed the decline as temporary, stating "there is no evidence of a trend toward smaller families."

to facilitate dosage 'CARDILATE'

brand Erythrol Tetranitrate

is now available in two tablet strengths

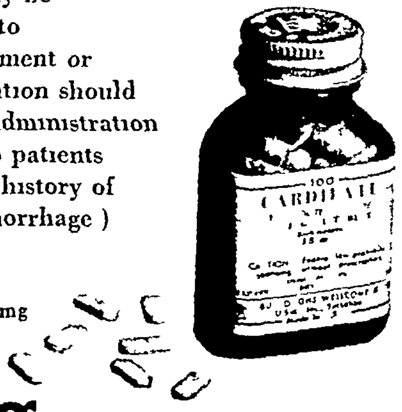
'Cardilate' provides, in one drug, rapid onset of effect (5-10 minutes) and prolonged duration of vasodilating action (4-5 hours), thereby facilitating adjustment of the therapeutic regimen to the angina patient's daily activities. For those whose plans vary from day to day, the rapid effect of 'Cardilate' permits administration of the drug just prior to known angina-precipitating situations.

For a routine day, the following schedule of administration is suggested.

Time	On arising	At lunchtime	4 to 5 P.M.	At bedtime (P.R.N.)
Dose	5-15 mg	5-15 mg	5-15 mg	5-15 mg

Additional doses may be administered prior to contemplated excitement or unusual stress. (Caution should be observed in the administration of 'CARDILATE' to patients with glaucoma or a history of recent cerebral hemorrhage.)

'CARDILATE' brand
Erythrol Tetranitrate
Sublingual Tablets of 5 mg
and 15 mg. scored



15 mg.

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Tuckahoe, New York

population in the event of a national disaster as follows

9 15–9 30 Opening Remarks
Speaker to be announced
9 30–9 45 Status Report on OCDM Health Service Programs
W Palmer Dearing, M D
9 45–10 05 Progress Report—First Year of Operation of Division of Health Mobilization
Carruth J Wagner, M D
10 05–10 30 Training of Professional Medical Personnel
Robert L Smith, M D
10 30–10 45 Break Period
10 45–11 15 Expanded Function Training
J M Whitney, M D
11 15–11 35 Health Manpower Management
Mr John D Rice
11 35–11 55 Health Resources Management
Mr Arnold H Dodge
11 55–12 25 Medical Self Help Program
Major James D Clark
12 30–1 45 Luncheon—Victorian Room
2 00–2 30 Chemical, Biological, and Radiological Defense Programs
Alan W Donaldson, M D
2 20–2 40 Environmental Sanitation and Water Supply
Mr Charles V Wright
2 40–3 40 Civil Defense Emergency Hospital Program
David M Benford, M D
(a) Historical Development of CDEH
(b) Current Training Program
(c) Operational Capabilities
3 40–4 00 Break Period
4 00–5 00 Panel Discussion — Utilization of CDEH in Training and for Emergencies
Carlisle S Lentz, M D, Max Klighoffer, M D, Robert L Smith, M D, Mr Jerrold M Michael
6 30–7 30 Social Hour—Victorian Room

Saturday—Nov 5, 1960
Red Lacquer Room

9 00–9 20 National Blood Program for Large-Scale Disasters
Walter C Clowers, M D
9 20–10 00 Regional Implementation of Health Mobilization Programs
(a) PHS Region III—George Moore, M D
(b) PHS Region VII—John M Whitney, M D
10 00–10 20 Federal Interagency Emergency Health Service Program
John W Walsh, M D
10 20–10 45 Health Mobilization Program During the Sixties
Richard L Hayes, M D
10 45–11 00 Break Period
11 00–11 30 Status of State CD Planning for Health Mobilization
Mack I Shanholtz, M D
11 30–12 30 Panel Discussion—Health Mobilization Relationship—Federal Through Local Governments
Carruth J Wagner, M D, Moderator
12 30–1 45 Luncheon—Victorian Room
2 00–2 15 Role of A M A Council on National Security
Harold C Lueth, M D
2 15–2 30 Role of A M A Committee on Military Medical Affairs
Reuben A Benson, M D
2 30–2 45 Role of A M A Committee on Disaster Medical Care
Carroll P Hungate, M D
2 45–3 00 Break Period
3 00–4 00 State and Local Medical Society CD Planning
3 00–3 10 (a) Administrative and Staff Programming
Speaker to be announced
3 10–3 25 (b) Organization and Leadership
Carroll P Hungate, M D
3 25–3 40 (c) Recruitment and Assignment of Personnel
Charles L Leedham, M D
3 40–3 55 (d) Education and Training Programs
Wayne P Chesbro, M D
3 55–4 05 Break Period
4 05–5 30 Question and Discussion Period (panel composed of all program speakers)

Sunday—Nov 6, 1960
Red Lacquer Room

9 00–9 15 Business Session
Justin J Stein, M D, Presiding
9 30–12 00 Workshop Sessions

Eight workshop sessions, corresponding to the OCDM regions, are scheduled to permit the conferees to discuss pertinent regional, state, and local problems In addition, each group will be assigned a specific topic for consideration

Each workshop group is expected to develop working agreements and arrangements on the basis of resources and problems within the respective regions Summary reports of the workshop groups will be reproduced at a later date and distributed to all conferees

Group 1

Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont
Moderator Charles W Steele, M D

Group 2

Delaware, District of Columbia, Kentucky, Maryland, Ohio, Pennsylvania, Virginia, West Virginia
Moderator Francis C Jackson, M D

Group 3

Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee
Moderator Charles N Wyatt, M D

Group 4

Illinois, Indiana, Michigan, Minnesota, Wisconsin
Moderator Max L Lichter, M D

Group 5

Arkansas, Louisiana, New Mexico, Oklahoma, Texas
Moderator Charles L Leedham, M D

Group 6

Colorado, Iowa, Kansas, Missouri, Nebraska, North Dakota, South Dakota, Wyoming
Moderator Carroll P Hungate, M D

Group 7

Arizona, California, Hawaii, Nevada, Utah
Moderator James E Fitzgerald, M D

12 30–2 00 **Luncheon—Victorian Room**
The Physician's Role in a Nuclear Disaster
Speaker Edward Teller, Ph D
Adjournment

ILLINOIS

Chicago

Dermatology Section Head Named—Dr Allen L Lorincz, associate professor of dermatology, University of Chicago, since 1957, has been appointed section head of dermatology in the department of medicine He succeeds Dr Stephen Rothman, who recently retired Dr Lorincz received his M D in 1947, completed his residency in dermatology in 1950, was appointed an instructor in 1951, and was promoted to assistant professor in 1952—all at The University of Chicago

Faculty Promotion—Dr Aldo A Luisada has been promoted from associate professor to full professor of medicine at The Chicago Medical School Dr Luisada first went to the Medical School in 1950 to establish its cardiovascular laboratories He is a graduate of the Royal University of Florence (Italy) Medical School and has held a number of professional posts in Italian Universities as well as in the U S

KENTUCKY

Psychiatrists Meet in Louisville—The first annual psychiatric seminar of the Jefferson County Chapter of the American Academy of General Practice was held at Our Lady of Peace Hospital, Louisville, Oct 27 The program was centered on diagnosis of the psychiatric reactions with emphasis on their prodromal stages The guest speaker was Dr Curtis Prout, Dedham, Mass , of Cornell Medical School, who presented "Diagnostic Significance of the Mental Status Examination "

MASSACHUSETTS

Personal—Dr Louis K Diamond, of the department of pediatrics, Harvard Medical School, and Children's Hospital Medical Center, Boston, has left for a four-month trip to the Near East, Central Africa, and Latin America, under a travel grant from the Rockefeller Foundation He will make a survey of the incidence, types and severity of anemias in children with kwashiorkor or nutritional failure He will also lecture on pediatric subjects in various cities After his return he will continue with an expanded program of research on causes and treatment of anemias in infancy and childhood in the Blood Grouping and the Hematology Research Laboratories, of which he is the director

MINNESOTA

Dr Visscher to Receive Lectureship Award—Albany Medical College's fourth Honorary Lectureship Award for 1960 will be presented to Dr Maurice B Visscher, professor and department chairman at the University of Minnesota Medical School Dr Visscher will be honored at ceremonies held in Huyck Auditorium at the medical college Nov 17 The lectureship award is given in recognition of 'distinguished service to mankind in the fields of science, medicine, and teaching" Consisting of an honorarium and an inscribed plaque, the award is the highest professional citation the college can bestow Dr Visscher has served as head of the department of physiology at Minnesota since 1936 He formerly acted in a similar capacity at both the University of Illinois and the University of Southern California His initial teaching appointment was to the faculty of the University of Tennessee in 1927

MISSOURI

News Publication for *Medical Center*—The first issue of a new intramural news publication titled 'On Call" and dealing with personnel and general

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Physicians are invited to send to this department items of news of general interest for example those relating to society activities new hospitals education, and public health Programs should be received at least three weeks before the date of meeting activities at the University of Missouri Medical Center has been published The publicaiton will be issued monthly by the center as a means for fostering closer relationships and understanding among personnel and departments The house organ, initially four pages in size, is scheduled to be expanded in the number of pages as the flow of news increases The center personnel takes in the staff of the School of Medicine, the School of Nursing, and the University Hospital, including teaching staff, but excluding students

NEW YORK

Professor Heidelberger Receives Swedish Award — Prof Michael Heidelberger, professor emeritus of the Institute of Microbiology at Rutgers University, has been awarded the Louis Pasteur Gold Medal of the Swedish Medical Society The award is only made every 10 years Dr Heidelberger was honored for developing methods for quantitative analysis of antibodies through the use of biochemistry The medal was accepted for him by an attaché of the United States Embassy in Stockholm Dr Heidelberger received an honorary doctorate from Upsala University in 1950

Dr Rusk Honored by Hundred Years Association — Dr Howard A Rusk, chairman, department of Physical Medicine and Rehabilitation, New York University Medical Center, and associate editor of the *New York Times,* is the first doctor to be honored with the annual Gold Medal award presented by the Hundred Years Association The association is composed of businesses and organizations in New York that are more than a century old, and the award is presented "in appreciation of individual contributions to standards and traditions of New York City" Dr Rusk was commended for his "world-wide contributions to the betterment of mankind," and particularly for his "evidence before the Senate committee which inspired the legislation introduced in 1958 to create international medical research and training programs"

New York City

Thomas William Salmon Lectures Scheduled —The annual Thomas William Salmon Lectures will be delivered Dec 5 at the New York Academy of Medicine, 2 E 103rd St, New York, at 4 30 P M and 8 30 P M The 1960 lecturer will be Harry F Harlow, Ph D, research professor at the University of Wisconsin since 1930 Much of Dr Harlow's work in the past 30 years has dealt with the behavior of rhesus monkeys He has analyzed the nature and development of their learning, and in the Salmon Lectures he will talk on, first, "The Affection of the Infant for the Mother," and, in the evening, he will discuss "Affection Between Infants and Adolescents" The Salmon Lectures, which have been given since 1932, are under the aegis of the Salmon Committee on Psychiatry and Mental Hygiene The committee is appointed by the Council of the New York Academy of Medicine The lectures, for the advancement of psychiatry and mental hygiene, are designed as permanent contributions to the field of medicine and are published later in book form

OREGON

French Professor Visiting in Oregon —Jacques Monod, professor of biochemistry at the Sorbonne and chef du service at the Institut Pasteur, Paris, has been visiting lecturer in biology at the Institute of Molecular Biology, University of Oregon, during the month of October

PENNSYLVANIA

Radiologist Receives Medal from Franklin Institute —Dr W Edward Chamberlain, of Washington, D C, has been named an Edward Longstreth Medalist of the Franklin Institute A special assistant to the chief medical director for atomic medicine, Veterans Administration, Dr Chamberlain was honored at formal ceremonies Oct 19 The Longstreth medal citation to Dr Chamberlain reads "For his continuous and effective analyses and applications of physics and engineering to the techniques of radiology, for his keen insight into all of the diverse phenomena contributing to the fluoroscopic process, and for his stimulation of the development of new devices" The medal, founded in 1890, was a gift to the Franklin Institute from Edward Longstreth, who was affiliated with the Baldwin Locomotive works and was vice-president of the institute from 1890-1894 The Longstreth Medal is awarded by the institute, a 136-year-old scientific and educational organization, for inventions of high order and for particularly meritorious improvements and developments in machines and mechanical processes Dr Chamberlain was professor of radiology at Temple University Medical School and director of the department of radiology at Temple University Hospital 1930-1957

Philadelphia

State Hospital Named Center for Remotivation — On Oct 4 the Philadelphia State Hospital was designated by the American Psychiatric Association as the National Training Center for Remotivation, a group discussion technique used in the rehabilitation of mental patients Dr Robert S Garber, Princeton, N J, chairman of the A P A's Committee on Remotivation, said the official designation was a logical one since the local hospital has been the headquarters for the program from its inception there in 1955 Dr Garber noted that the remotivation technique is basically a group discussion program in which psychiatric aides work with a small number of mental patients to help stimulate—through planned conversation sessions—a desire to return to reality He pointed out that the remotivation program, which is supported by funds from the Smith Kline & French Foundation, has been introduced to some 600 nurses and aides in 35 hospitals by the Philadelphia training teams These nurses and aides in turn have carried the program to about 2,200 other psychiatric personnel in about 100 additional hospitals

New Psychiatric Research Laboratory Dedicated—A new $206,000 Laboratory for Research in Psychiatry at the University of Pennsylvania School of Medicine was dedicated Sept 30 to Dr Kenneth E Appel, chairman of the School of Medicine's Department of Psychiatry since 1953 Funds for construction of the facility were derived from university sources and matched by a grant from the U S Public Health Service

TEXAS

Dr Harris Acclaimed by Psychiatrists—Experts in psychiatry from all parts of the nation made a pilgrimage to the Medical Branch of the University of Texas Sept 17 to honor Dr Titus H Harris Nearly 150 members of the newly formed Titus Harris Society attended the first reunion of doctors who took their resident training under Dr Harris in this specialty Dr Harris, under whose direction the psychiatry training programs at the university's medical center have grown, has headed the department of neurology and psychiatry since 1926, when it was formed After receiving his medical degree at the University of Texas in 1919, he became an instructor in medicine and rose to assistant professor in that department before moving into his specialized field Dr Harris founded *Diseases of the Nervous System* in 1939 and has remained its editor for 21 years Dr Abe Hauser, of Houston, Dr Harris's first graduate, is president of the new society, and Dr Martin L Towler, Galveston, is vice-president Dr Ivan Bruce, Galveston, is secretary-treasurer, and Dr Edgar S Ezell, of Fort Worth, and Dr E F Harrington, of Dallas, serve as counsellors The society will meet annually in various Texas cities

GENERAL

Fellowships Available in Industrial Medicine—The Atomic Energy Commission invites applications for special fellowships in industrial medicine for the academic year 1961-1962 The fellowships are open to men and women physicians who are citizens of the U S, who have graduated from an approved college of medicine at least two years before tenure of the fellowship, and who are licensed to practice medicine in one of the sttaes or territories of the U S A full F B I background investigation and clearance will be necessary The stipend during a fellowship or academic year is $5,000 Applications should be filed before Jan 1, 1961 For information, write A E C Fellowships in Industrial Medicine, Atomic Energy Project, University of Rochester School of Medicine and Dentistry, Rochester 20, N Y, attention Dr Henry A Blair

Meeting of Psychoanalysts in New York—The midwinter meeting of the Academy of Psychoanalysis will be held Dec 10-11 at the Hotel Biltmore, New York City The theme of the meeting is 'The Role of Values in the Psychoanalytic Process," and there will be morning and afternoon sessions on both days, during which 9 scientific papers will be presented A cocktail dance is scheduled For information, write Dr Joseph H Merin, Academy of Psychoanalysis, 125 E 65th St, New York 21

Measles Vaccine to be Tested—Expenditure of $159,885 to finance a 5-year test of a new measles vaccine has been approved by New York City Health Research Council The vaccine was developed in Boston by a group under the direction of Prof John F Enders, of Harvard Medical School, and will be given to children on Staten Island and in Nigeria Dr Saul Krugman, chairman, department of pediatrics, New York University Medical Center, is in charge of a team of N Y U scientists who will conduct the test and who will leave for Africa in November Nigeria has been selected because the high incidence of the disease there will speed up the testing program

Increase in School-Age Population—With 45,000,000 school-age children filling the nation's schoolrooms to overflowing for the new school year, the U S faces the problem of providing facilities for a school population of 53,000,000 by 1970, according to a report by statisticians of the Metropolitan Life Insurance Company Increases in school enrollments will be especially marked in the West and in suburban communities throughout the country

Psychiatrists to Meet in Denver—The 10th annual meeting of the National Association for Mental Health will be held in Denver Nov 17-19 The convention will be launched with a luncheon session, Nov 17, at which Dr Francis J Braceland, Hartford, Conn, psychiatrist-in-chief of the Institute of Living, will sound the keynote, "A Decade of Progress' Dr E Vincent Ashey, President of the American Medical Association, will be the banquet speaker Nov 18 The review of a decade of progress will explore four major areas psychiatric services in hospitals, research, information and referral services, and the new N A M A mental health career program For information, write National Association for Mental Health, 10 Columbus Circle, New York 19

Society News—The following officers were elected at the recent meeting of the **American Society of Clinical Pathologists** president, Dr John J Andujar, Fort Worth, Texas, president-elect, Dr Merlin L Trumbull, Memphis, Tenn, vice-president, Dr Harold D Palmer, Denver, secretary-treasurer, Dr Lester H Hoyt, Indianapolis —Officers of the **American Association of Blood Banks** are Dr John R Schenken, Omaha, president, succeeding Dr Elmer R Jennings, of Long Beach, Calif, Dr Keith D McMilan, Eugene, Ore, president-elect, Dr Mark F Lesses, Boston, vice-president, Dr Frank E Trobaugh Jr, Chicago, secretary, and Mrs Bernice M Hemphill, San Francisco, (reelected) treasurer —The following officers were elected at a recent meeting of the **American Roentgen Ray Society** president, Dr Harold G Reineke, Cincinnati, president-elect, Dr Traian Leucutia, Detroit, first vice-president, Dr Clyde A Stevenson, Spokane, Wash, second vice-president, Dr Samuel W Donaldson, Ann Arbor, Mich, secretary, Dr C Allen Good, Rochester, Minn, treasurer, Dr Stephen W Brown, Augusta, Ga, chairman of executive council, Dr Ralph M Caulk, Washington, D C

Committee to Study Cost of Medical Care—The AMA's Commission on the Cost of Medical Care, having completed the preliminary staff work necessary to its activity, held its first official meeting Oct 8-9 in Chicago Authorized by the Board of Trustees in February and given an initial grant of $100,000 for its study of the cost or spending involved in the provision and purchase of health care, the Commission agreed at the meeting on recommended objectives, the scope of its study, and methods of procedure the Commission will follow Chairman Louis M Orr, M D, Orlando, Fla, and Vice-Chairman David B Allman, M D, Atlantic City, N J, will direct the Commission's investigation of such matters as changes in the improvements, quantity, prices, expenditures, financing mechanisms, and methods of providing medical care in recent years, and their effect on the price of —and expenditures for—the individual components of medical care Dr Orr said that the Commission's membership has been divided among three separate committees for the purposes of the study

Committee on Diagnosis, Therapy, and Clinical Management of Diseases Drs Ovid O Meyer, chairman, Madison, Wis, William B Hildebrand, Menasha, Wis, Jesse W Read, Tacoma, Wash, John C Reece, Morganton, N C, and Russell B Roth, Erie, Pa

Committee on Financing Mechanisms Drs Donald H Stubbs, Washington, D C, chairman, John A Layne, Great Falls, Mont, Claude M Lee, Boston, and Homer C Pheasant, Los Angeles

Committee on Economics of Medical Care Drs Charles L Hudson, Cleveland, chairman, Everett C Fox, Dallas, Robert B O'Connor, Pittsburgh, and Samuel R Sherman, San Francisco

Association for Study of Headache Names Officers—The American Association for the Study of Headache was organized this summer at the time of the annual AMA meeting in Miami The following officers were elected president, Dr Henry D Ogden, New Orleans, vice-president, Dr Walter C Alvarez, Chicago, Dr Robert E Ryan, St Louis, secretary, Dr Bayard T Horton, Rochester, Minn, moderator, Dr George L Waldbott, Detroit The association welcomes to its membership any physician—specialist or general practitioner—who is interested in the study of headache Information can be obtained from the secretary, Dr Bayard T Horton, Mayo Clinic, Rochester, Minn

Recipients of Gold Heart Awards Named—The American Heart Association named two physicians and a layman to receive its 1960 Gold Heart Awards for outstanding contributions to cardiovascular medicine and to the Heart Association program They are Dr Herrman L Blumgart, professor of medicine, Harvard Medical School, and physician-in-chief, Beth Israel Hospital, Boston, Dr Robert L King, clinical associate professor of medicine, University of Washington School of Medicine, Seattle, and Mr Eddie Cantor, entertainer The Gold Heart Awards, highest honor of the American Heart Association, were presented at the association's annual dinner in St Louis, Oct 23, in conjunction with the organization's annual meeting and scientific sessions Dr Blumgart was cited for his services as editor-in-chief of *Circulation*, one of the four professional journals of the American Heart Association He has headed the staff of the publication since 1956 Dr King, a former president of the American Heart Association, was honored for having "helped to sharpen our program objectives and to strengthen our scientific leadership in the continuing fight against cardiovascular diseases" He was a member of the association's board 1948-1952 and has since served as chairman of its Budget and Budget Advisory Committees and as a member of other committees Mr Cantor, known through his many appearances for the Heart Fund as "America's Heart Ambassador," was cited for having "given generously of his time and talent to save hearts and lives"

Interstate Postgraduate Meeting in Pittsburgh—On Oct 31-Nov 3 the Interstate Postgraduate Medical Association of North America will meet at the Pittsburgh-Hilton Hotel, Pittsburgh The program includes 36 participants Two panel discussions are planned "Diabetes" and "Peripheral Arterial Diseases" Scientific breakfasts, orthopedic and dermatological clinics, and recess demonstrations are included in the program The annual dinner will include a talk by Dr Robert L Schaeffer, Allentown, Pa The program is acceptable for 16½ hours of category I credit by the American Academy of General Practice For information, write the Interstate Postgraduate Medical Association of North America, Box 1109, Madison 1, Wis

Five-Year Study of Rheumatic Fever Reports High Survival Rate—The American Heart Association announced Oct 12 that remarkably few deaths due to rheumatic fever was "the striking fact" to emerge from a 5-year cooperative study of the disease, according to a report published recently Medical centers of the United States, the United Kingdom, and Canada participated in the study Because of the severe heart disease to which it may lead, rheumatic fever has been a major cause of death among children But of the 497 child patients studied in three countries, only 14, or 3%, were known to have died of this disease or its consequences at the end of 5 years, a much lower case fatality than has been previously reported by other investigators The condition of the rheumatic fever patient's heart at the start of treatment usually determined whether he was to have heart disease at the end of 5 years Almost all—96%—of the patients whose hearts were unaffected when treatment began were found to be free of any heart trouble at the end of this study And the likelihood that a patient would contract rheumatic heart disease—as well as its severity—increased with the extent to which his heart was affected before treatment began Of the child patients with a soft heart murmur, for example, 82% had no murmur at the end of 5 years But, despite treatment, only 30% of those whose hearts were the most seriously affected by rheumatic fever at the beginning (with heart failure and/or pericarditis) were free of a heart murmur 5 years later The international study followed the child patients in each country through 6 weeks of treatment, 3 succeeding weeks of close observation, and 5 years of periodic check-ups thereafter, in order to test the relative effectiveness of ACTH, cortisone, and acetylsalicylic acid To make this large-scale study possible, the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association and the Medical Research Council of Great Britain jointly planned the carefully controlled program to test the three drugs, in the hope of finding a more effective therapy for rheumatic fever than acetylsalicylic acid Under their auspices, and with grants from the U S Public Health Service, the Canadian Arthritis and Rheumatism Society, the American Heart Association, and the Medical Research Council, the cooperative project was initiated in January, 1951 Children under the age of 16 with rheumatic fever were studied in 6 United Kingdom, 1 Canadian, and 5 U S Medical centers Dr David D Rutstein served as chairman of the coordinating center at the American Heart Association in New York Participating U S institutions were La Rabida Jackson Park Sanitarium, Chicago, College of Physicians and Surgeons, Columbia University, University of Colorado Medical Center, Denver, House of the Good Samaritan, Boston, and New York University-Bellevue Medical Center The Canadian center was the Hospital for Sick Children, Toronto, Canada

Foreign Fellowships Available for Medical Students—The Association of American Medical Colleges invites applications for foreign fellowships in an unusual fellowship program Begun last year as the Smith Kline & French Foreign Fellowships, this program enables selected medical students to benefit from unusual clinical experiences and to practice preventive medicine at outpost facilities in greatly differing societies and cultures Application forms and brochures detailing complete information on the SK&F Foreign Fellowships have been mailed to deans of all U S medical schools, and must be returned to the AAMC by Dec 31 Awards will be announced in early March Fellowships are available to men and women who have completed their junior year of medical school, eligibility will continue through the senior year Those who have started internships will not be eligible Fellowships provide money for travel costs and living expenses during the time of the student's overseas program The amount of the grant will vary depending on the proposed program and its location Students applying for the fellowships must locate the foreign site at which they wish to study and obtain sponsorship from the medical director at the overseas post in order to be considered for an award The average length of time spent abroad by SK&F Fellows is about 12 weeks

Road Safety Research Project Award—A study of driver improvement under the point systems used today by some state driver-license administrators was named the nation's top safety research project by the National Safety Council It was the first such citation by the council The project was financed by a 2-year grant totaling $40,000 from the Esso Safety Foundation and was sponsored by the American Association of Motor Vehicle Administrators It was prepared by the Institute of Government of the University of North Carolina, under the direction of B J Campbell, administrator of research with Cornell University's automotive crash injury research program Mr Campbell will receive $1,000 and a plaque The award is administered by the National Safety Council under a grant from the Metropolitan Life Insurance Company. The project was judged "the most significant contribution toward the reduction of accidental injuries and death." "Point systems," the National Safety Council explained, "are used by some states in driver-licensing programs to identify problem drivers—through traffic arrests and convictions and warnings issued by police." Every state using a point system was considered in the award-winning study, as well as the traffic records of 40,000 drivers.

Preventive Medicine Meeting in San Francisco.—The seventh annual meeting of the American College of Preventive Medicine will be held Nov. 2-3 in San Francisco, under the presidency of Dr. James H. Sterner, Rochester, N. Y. The program will include the following papers:

Water—Its Impact on Society, Abel Wolman, Dr. in Engrg., Baltimore.
The Untapped Promise of Electronic Medicine, James Hillier, Ph.D., Camden, N. J.
Occupational Health and Public Health, Parallelisms and Divergences in Problems and Practices, Dr. Robert A. Kehoe, Cincinnati.
Use of Live Poliovirus Vaccine in an Attempt to Eradicate Poliomyelitis, Dr. Albert B. Sabin, Cincinnati.

On Nov. 2 the fourth annual Lectureship on Preventive Medicine, "Radiation Control: Its Problems in Public Health," will be given by Dr. Russell H. Morgan, head of radiology, Johns Hopkins School of Medicine, Baltimore. For information, write Dr. John J. Wright, P. O. Box 1267, Chapel Hill, N. C.

Formation of Committee on Poliomyelitis Control.—The U. S. Public Health Service announced the formation of a Surgeon General's Committee on Poliomyelitis Control, to be made up of 23 organizations. The committee, according to Surgeon General Leroy E. Burney, has been formed to consider recommendations on the use and distribution of live oral poliovirus vaccine which is expected to go into production about mid-1961. The 23 organizations serving on the Surgeon General's Committee on Poliomyelitis Control are as follows: American Academy of Pediatrics, American Academy of General Practice, American College of Preventive Medicine, American Hospital Association, American Medical Association, American Nurses Association, American Pharmaceutical Association, American Public Health Association, AFL-CIO, Association of State and Territorial Health Officers, Association of State and Territorial Public Health Educators, Association of State and Territorial Public Health Laboratory Directors, Children's Bureau, Conference of State and Territorial Epidemiologists, Council of State Governments, Department of Defense, General Federation of Women's Clubs, National Congress of Colored Parents and Teachers Association, National Congress of Parents and Teachers Association, National Foundation, National Health Council, National Medical Association, Inc., Pharmaceutical Manufacturers' Association.

Medicine Offers Maximum Promise to Today's Student.—Since 1956 the number of students applying for admission to the nation's 85 medical schools has dropped from 15,917 to 14,951. In 1947 nearly 7% of all college graduates made applications to medical schools, while in 1958 the figure was only 4%. The low birth rates in the '30's as well as multiplying opportunities in other fields are thought to be contributory causes. This decline in the number of applicants is occurring at a time when the rate of progress in the medical field is higher than ever. In 1940 medical research activities cost 45 million dollars. This year it will reach roughly 600 million dollars, and the predicted figure for 1970 is 3 billion dollars. Nine new medical schools have been created since the end of World War II. Other encouraging factors are an attempt to combine college and medical school into a single program, thus enabling a student to obtain his M.D. in 6 or 7 years, and the increase in financial resources now available to the medical student.

International Psychosomatic Seminars.—A cruise is to be arranged during the winter of 1962-1963 for physicians interested in sharing their professional experience with practitioners around the world in International Psychosomatic Seminars. The plan is to leave New York in October or November, 1962, sailing by way of the Panama Canal to Los Angeles and San Francisco. Countries to be visited include Japan, Hong Kong, Malaya, Ceylon, India, Pakistan, Egypt, Italy, France, and Spain, and the cruise is expected to take about 14 weeks. A teaching seminar will be held in every port visited and ample time will be allowed for sight-seeing. Reservations will have to be made well in advance, but if sufficient qualified persons volunteer their services, further psychosomatic seminars will be organized. For information, write Dr. James L. McCartney, 223 Stewart Ave., Garden City, N. Y.

Standards to Protect Workers from Radiation.—The 44th session of the International Labour Conference, which met in Geneva in June, adopted a convention outlining standards for the effective protection of the health and safety of workers against ionizing radiations. It urges that unnecessary exposure to ionizing radiations should be avoided. The convention provides for the establishment of maximum permissible doses of radioactive substances, levels being fixed both for workers over 18 years of age and for those under 18 No worker under 16 years of age may be engaged in radiation work Levels are also to be fixed for workers not directly engaged in radiation work who may be exposed in passing The convention provides for the use of appropriate warnings to indicate the presence of radiation hazards, the instruction of workers in precautionary measures, and a system of medical examinations to protect the worker's health

Semmelweis Medal and Lecture Announced —The Igraz Semmelweis Meeting of the American Hungarian Medical Association will be held at the New York Academy of Medicine Nov 4, 8 30 P M This year's recipient of the Semmelweis Medal is Dr Laszlo Zechmeister, who will present Some Biochemical Studies on Provitamins A and Carcinogens"

Joint Meeting on Tropical Medicine and Parasitology —The 9th annual meeting of the American Society of Tropical Medicine and Hygiene and the 35th annual meeting of the American Society of Parasitologists will be held Nov 2-5 at the Biltmore Hotel, Los Angeles President of the tropical medicine group is Willard H Wright, Ph D , Bethesda, Md , and president of the parasitologists society is Dr Harold W Brown, Muskegon, Mich Among the 71 papers scheduled on the program are the following which include foreign authors

- Eradication of Triatomid Bugs in Brazil, Emmanuel Dias Rio de Janeiro Brazil
- Progress of Recent Studies of Kyasanur Forest Disease in India, Harold Trapido and Keerti V Shah, Poona, India
- The Immobilization Reaction in the Diagnosis of Amebiasis, Francisco Biagi F and Leonor Buentello, Mexico, D F
- Cutaneous Amoebiasis in Mexico, Alfonso Martuscelli, Faustino Navarette and Francisco Biagi, Mexico, D F
- Evaluation of the Complement Fixation Reaction in the Diagnosis of Cerebral Cysticercosis, Francisco Biagi F Faustino Navarrete, Bertha Martinez, and Ana Maria Santiago, Mexico, D F
- A Clinical Trial with New Dithiazanine Formulations Jorge Tay, Alfonso Martuscelli, and Clementina Gonzalez Mexico, D F

A symposium 'Arthropod-borne Viruses" is scheduled for the morning of Nov 3 Motion pictures and scientific exhibits are planned For information, write Dr Rolla B Hill, 3575 St Gaudens Rd , Miami 33, Fla , Executive Secretary

Meeting of Southern Medical Association in St Louis —The 54th annual meeting of the Southern Medical Association will be held Oct 31-Nov 3 at the Kiel Auditorium, St Louis, under the presidency of Dr Edwin H Lawson, New Orleans A symposium on cerebrovascular disease is scheduled for the morning of Oct 31, with Dr James G Galbraith, Birmingham, Ala , as chairman, and on the morning of Nov 3 a symposium on the medicoeconomics of medicine will have Dr Robert D Moreton, Fort Worth, Texas, as chairman The program includes the following guest speakers Dr Carl E Arbesman, Buffalo, Dr John L Fromer, Boston, Dr Wade Volwiler, Seattle, Dr John W Sigler, Detroit, Dr Roger B Scott, Cleveland, Dr Joseph Alban Quigley, Cincinnati, Dr Peter H Forsham, San Francisco, Dr Percival Bailey Chicago, Dr Edward C Hughes, Syracuse, N Y , Dr John H Moe, Minneapolis, Dr Henry Diamond, New York, Dr James B Arey, Philadelphia, Dr Alfred R Shands Jr , Wilmington, Del , Dr Walter A Fansler, Minneapolis, Dr Emil Frei, III, Bethesda, Md , and Dr James E Thompson, New York Colored television programs and scientific and technical exhibits are planned Entertainment will include a golf tournament, Nov 1-2 For information, write Mr Robert F Butts, 2601 Highland Ave , Birminghom 5, Ala , Executive Secretary

CANADA

Annual Lecture Given in Montreal —The 23rd annual Louis Gross Memorial Lecture, under the auspices of the Montreal Clinical Society, was delivered at the Jewish General Hospital, Montreal, on Oct 11 by Dr William Dock, professor of medicine, State University of New York The subject was 'The Causes and Evolution of Coronary Obstruction "

FOREIGN

Mental Deficiency Conference Held in London — A conference on the scientific study of mental deficiency, the first international multidisciplinary conference dealing with mental deficiency, took place in London, England, in July Over 650 participants from more than 40 countries attended, including over 200 members of the American Association of Mental Deficiency Dr Thomas L Pilkington, Leicester, England, was chairman of the British organizing committee The complete proceedings of the conference will be available before Jan 1, 1961 Participants at the conference voted to form a temporary committee to organize a permanent international association and to plan for a second international conference

Color Television Unit to Tour Australia —The mobile color television unit, manufactured for Smith, Kline and French Laboratories, Ltd , which has been used for the last two years in hospitals and medical schools in England, has been sent to Australia for a three-month demonstration tour which will include hospitals in Adelaide, Melbourne, Brisbane, and Sydney

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC

Educational Council for Foreign Medical Graduates Stations around the world April 4 Closing date for filing applications is Jan 4 Exec Director, Dr Dean F Smiley, 1710 Orrington Ave, Evanston, Ill

BOARDS OF MEDICAL EXAMINERS

Alabama *Examination* Montgomery, June 20-21 *Reciprocity* Continuously Sec, Dr D G Gill, State Office Bldg, Montgomery 4

Arkansas * *Examination and Reciprocity* Little Rock, Nov 10-11 Sec, Dr Joe Verser, Harrisburg

Alaska * On application in Anchorage or Fairbanks Sec, Dr W M Whitehead, 172 South Franklin St, Juneau

California *Oral and Clinical* Los Angeles, Nov 20 *Oral for Reciprocity Applicants* Los Angeles, Nov 19 Sec, Dr Louis E Jones, Room 536, 1020 N Street, Sacramento

Canal Zone On Application Acting Sec, Dr B K Levin, Health Bureau, Balboa Heights

Colorado * *Examination* Denver, Dec 13-14 *Reciprocity* Denver, Oct 11 Exec Sec, Miss Mary M McConnell, 715 Republic Bldg, Denver 2

Connecticut * *Examination* Hartford, Nov 8-10 *Endorsement* New Haven, Nov 30 Sec, Dr Stanley B Weld, 160 St Ronan St, New Haven *Homeopathic Examination* Derby, Oct 18 Sec, Dr Donald A Davis, Derby

Delaware *Examination* Dover, Jan 10-12 *Endorsement* Dover, Jan 19 Sec, Dr Joseph S McDaniel, Professional Bldg, Dover

District of Columbia * *Examination* Washington, Dec 12-13 *Reciprocity and Endorsement* Continuously Deputy Director, Department of Occupations and Professions, Mr Paul Foley, 1740 Massachusetts Ave N W, Washington 6

Florida * *Examination* Miami Beach, Nov 20-22 *No Reciprocity* Sec, Dr Homer L Pearson, 901 N W 17th St, Miami 36

Guam *Subject to Call* Sec, Dr F L Conklin, Agana

Hawaii *Examination* Honolulu, Jan 9-19 *Reciprocity* Continuously Sec, Dr Harry L Arnold, Jr, 1000 Ward Ave, Honolulu

Idaho *Examination and Endorsement* Boise, Jan 9-11 Sec, Mr Armand L Bird, 358 Sonna Bldg, Boise

Indiana *Examination* Indianapolis, June 20-22 *Endorsement* Indianapolis, fourth Wednesday each month Exec Sec, Miss Ruth Kirk, 538 K of P Bldg, Indianapolis

Kansas * *Examination* Kansas City, Jan 19-20 *Reciprocity* Kansas City, Jan 21 Sec, Dr F J Nash, New Brotherhood Bldg, Kansas City

Kentucky *Examination* Louisville, Dec 12-13 *Reciprocity* Continuously Sec, Dr Russell E Teague, 620 South Third St, Louisville 2

Louisiana *Examination and Reciprocity* New Orleans, Dec 8-10 Sec, Dr Edwin H Lawson, 930 Hibernia Bank Bldg, New Orleans

Maine *Examination and Reciprocity* Brunswick, Nov 1-3 Sec, Dr Daniel F Hanley, Box 637, Brunswick

Maryland *Examination* Baltimore, June 13-16 (Tentative) Sec, Dr Frank K Morris, 1211 Cathedral St, Baltimore 1

Massachusetts *Examination* Boston, January *Reciprocity* Continuously Sec, Dr David W Wallwork, Room 37, State House, Boston 33

Minnesota * *Reciprocity* November Sec, Dr J P Medelman, 230 Lowry Medical Arts Bldg, St Paul 2

Mississippi *Endorsement* Jackson, Dec 5 Sec, Dr A L Gray, State Board of Health, Jackson

Nebraska * *Examination* Omaha, June Director, Bureau of Examining Boards, Mr R K Kirkman, Room 1009, State Capitol Bldg, Lincoln 9

Nevada *Examination and Reciprocity* Reno, Dec 7 Sec, Dr G H Ross, 112 North Curry St, Carson City

New Jersey *Reciprocity* Continuously Sec, Dr Royal A Schaaf, 28 West State St, Trenton

New Mexico * *Examination and Reciprocity* Santa Fe, Nov 21-22 Sec, Dr R C Derbyshire, 227 East Palace Ave, Santa Fe

New York *Examination* Albany, Buffalo, New York, Rochester and Syracuse, Dec 6-9 Sec, Dr Stiles D Ezell, State Education Bldg, Albany

North Dakota *Examination* Grand Forks, Jan 11-13 *Reciprocity* Grand Forks, Jan 14 Sec, Dr C J Glaspel, Box 228, Grafton

Ohio *Examination* Columbus, Dec 12-14 *Endorsement* Columbus, Oct 4 Sec, Dr H M Platter, 21 W Broad St, Columbus 15

Oregon * *Reciprocity* Quarterly Exec Sec, Mr Howard I Bobbitt, 609 Failing Bldg, Portland

Pennsylvania *Examination* Philadelphia, January *Endorsement* Continuously Sec, Mrs Margaret G Steiner, Box 911, Harrisburg

South Carolina *Examination and Reciprocity* Columbia, Dec 13-14 Sec, Dr Harold E Jervey, Jr, 1329 Blanding St, Columbia, South Carolina

South Dakota * *Examination* Sioux Falls, Jan 16-17 *Reciprocity* Continuously Exec Sec, Mr John C Foster, 711 N Lake Ave, Sioux Falls

Texas * *Examination* Fort Worth, Dec 1-3 *Reciprocity* Fort Worth, Dec 1-3 Sec, Dr M H Crabb, 1714 Medical Arts Bldg, Fort Worth

Utah *Examination* Salt Lake City, July 5-7 Sec, Mr Frank E Lees, 324 State Capitol Bldg, Salt Lake City 1

Virginia *Examination and Reciprocity* Richmond, Nov 29-Dec 2 Sec, Dr R M Cox, Portsmouth

Virgin Islands *Examination* Charlotte Amalie, Nov 9-10 Sec, Dr Benjamin A Nath, Charlotte Amalie, St Thomas

Washington * *Reciprocity* Continuously Administrator, Mr Thomas A Carter, Capitol Bldg, Olympia

West Virginia *Examination* Charleston, Jan 1961 *Reciprocity* Charleston, Oct 3 Sec, Dr Newman H Dyer, State Office Bldg, No 3, Charleston 5

Wisconsin * *Examination* Madison, Jan 10-12 *Reciprocity* Madison, Oct 14 Sec, Dr Thomas W Tormey, Jr, 115 South Pinckney St, Madison

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MEETINGS

AMERICAN MEDICAL ASSOCIATION Dr F J L Blasingame, 535 North Dearborn St, Chicago 10, Executive Vice-President
1960 Clinical Meeting, Washington, D C, Nov 28-Dec 1
1961 Annual Meeting, New York City, June 26-30
1961 Clinical Meeting, Denver, Nov 27-30
1962 Annual Meeting, Chicago, June 11-15
1962 Clinical Meeting, Los Angeles, Nov 26-29
1963 Annual Meeting, Atlantic City

AMERICAN

1960

October

American Fracture Association, El Presidentia Hotel, Mexico, D F, Mexico, Oct 30-Nov 4 Dr H W Wellmerling, 610 Griesheim Bldg, Bloomington, Ill Executive Secretary

American Public Health Association, San Francisco, Oct 30-Nov 4 Dr Berwyn F Mattison, 1790 Broadway, New York 19, Executive Director

American School Health Association, San Francisco Oct 30-Nov 4 Dr A O DeWeese, 515 E Main St Kent, Ohio, Executive Secretary

Association of American Medical Colleges, Diplomat Hotel, Hollywood Beach Fla, Oct 31-Nov 2 Dr Ward Darley, 2530 Ridge Ave, Evanston, Ill, Executive Director

Association of Military Surgeons of the United States, Mayflower Hotel Washington, D C, Oct 31-Nov 2 Lt Col George M Beam, AUS, Retired, 1726 Eye St, N W, Washington 6 D C

Interstate Postgraduate Medical Association of North America, Pittsburgh-Hilton Hotel Pittsburgh Oct 31-Nov 3 Mr Roy T Ragatz, Box 1109, Madison 1, Wis, Executive Director

Omaha Mid-West Clinical Society, Civic Auditorium, Omaha Oct 31-Nov 3 Dr William J Reedy 1613 Medical Arts Bldg, Omaha 2, Director

Society of Pelvic Surgeons, Marriott Motor Hotel Arlington Va, Oct 28-29 Dr Laman A Gray 216 Heyburn Bldg, Louisville Ky Secretary-Treasurer

Southern Medical Association, St Louis Oct 30-Nov 3 Mr Robert F Butts 2601 Highland Ave Birmingham 5 Ala, Executive Secretary

Southern Society for Pediatric Research Vanderbilt University School of Medicine, Nashville, Tenn, Oct 29-30 *For information write Dr* Mildred Stahlman, Dept of Pediatrics Vanderbilt University School of Medicine Nashville Tenn

November

American College of Chest Physicians, Shoreham Hotel, Washington D C, Nov 26-27 Mr Murray Kornfeld 112 E Chestnut St Chicago 11, Executive Director

American Medical Writers' Association Hotel Morrison, Chicago, Nov 18-19 Dr Harold Swanberg, 510 Maine St, Quincy, Ill, Secretary

American Society of Tropical Medicine and Hygiene, Biltmore Hotel Los Angeles, Nov 2-5 Dr Rolla B Hill 3575 St Gaudens Rd Miami 33, Fla Executive Secretary

Association of Clinical Scientists Shoreham Hotel Washington D C (Applied Seminar on Measurements of Pancreatic Function in Clinical Medicine, Nov 4-5 Dr F William Sunderman, 1025 Walnut St, Philadelphia 7) Annual Meeting, Nov 6 Dr Robert P MacFate 54 W Hubbard St, Chicago 10 Secretary

Central Society for Clinical Research, Drake Hotel Chicago, Nov 4-5 Dr Austin S Weisberger, 2065 Adelbert Rd, Cleveland 6, Secretary

New England Society of Allergy, Long-Wood Towers, Brookline, Mass, Nov 2 Dr Harry Louis Mueller, 300 Longwood Ave, Boston, Secretary

Pacific Coast Fertility Society, Hotel Tropicana, Las Vegas, Nev, Nov 10-13 Dr Anah C Wineberg 3120 Webster St, Oakland, Calif, Secretary-Treasurer

Puerto Rico Medical Association, Santurce, Nov 15-19 Mr Jesus A Sanchez, P O Box 9111 Santurce 29 P R, Executive Secretary

Southern Thoracic Surgical Association, British Colonial Hotel, Nassau, Bahamas, Nov 17-20 For information write Dr Hawley H Seiler, 517 Bayshore Blvd Tampa 6, Fla, *Secretary*

December

Academy of Psychoanalysis, Hotel Biltmore, New York, Dec 10-11 Dr Joseph H Merin, 125 E 65th St, New York 21, Secretary

American Academy of Dermatology and Syphilology, Palmer House, Chicago, Dec 3-8 Dr Robert R Kierland, First National Bank Bldg, Rochester, Minn, Secretary-Treasurer

American Rheumatism Association, Sheraton Dallas Hotel, Dallas Texas, Dec 9 Mr Gerard W Speyer, 10 Columbus Circle, New York 19, Executive Secretary

Conference on Graduate Medical Education—"Educational Problems in the Internship and Residency, University of Pennsylvania Graduate School of Medicine, Dec 1-2 For information write Dr Paul Nemir Jr, 237 Medical Laboratories Bldg, Philadelphia 4 Dean

New York Heart Association, Symposium on the Myocardium, Its Biophysics and Biochemistry, Waldorf-Astoria Hotel New York City Dec 9-10 For information write Dr Alfred P Fishman N Y Heart Ass n, 10 Columbus Circle, New York 19

Radiological Society of North America Netherland Hilton Hotel, Cincinnati, Dec 4-9 Dr Donald S Childs, 713 E Genesee St Syracuse 2, N Y, Secretary

Society of Biological Psychiatry Hotel Roosevelt, New York City Dec 8 Dr George N Thompson, 2010 Wilshire Blvd Los Angeles 57 Secretary

Southern Surgical Association, Boca Raton Hotel Boca Raton, Fla Dec 6-8 Dr J D Martin, Jr, Emory University, Atlanta 22 Ga Secretary

U S Virgin Islands Medical Society Virgin Islands Hotel, St Thomas Virgin Islands, December Dr C Warren Smith, Knud Hansen Memorial Hospital P O Box 1201 Virgin Islands Executive Secretary

Western Surgical Association, Hotel Statler, Detroit Dec 1-3 Dr John T Reynolds, 612 N Michigan Ave, Chicago 11 Secretary

1961

January

American Academy of Orthopaedic Surgeons, Hotel Americana Bal Harbour, Miami Beach, Fla Jan 8-13 Mr John K Hart, 116 S Michigan Ave, Chicago 3, Executive Secretary

American College of Surgeons, Sectional Meeting Hotel Dinkler-Tutwiler Birmingham Ala, Jan 16-18 Dr William E Adams Am Coll of Surgeons, 40 E Erie St Chicago 11 *Secretary*

Clinical Congress of Abdominal Surgeons, Deauville Hotel Miami Beach, Jan 30-Feb 3 Dr Blaise F Alfano 663 Main St, Melrose 76 Mass

Northwest Society for Clinical Research Hotel Georgia, Vancouver B C Canada, Jan 7 Dr John R Hogness, University Hospital Seattle Secretary-Treasurer

Western Society for Clinical Research Carmel-by the Sea Calif Jan 26-28 Dr William N Valentine U of Calif Med Center, Dept of Med, Los Angeles 24 Secretary-Treasurer

February

American Academy of Allergy, Statler-Hilton Hotel Washington, D C Feb 6-8 Mr James O Kelley 756 N Milwaukee St Milwaukee 2 Wis Executive Secretary

American Academy of Forensic Sciences Drake Hotel Chicago, Feb 23-25 Dr W J R Camp, 1853 W Polk St Chicago 12, Secretary-Treasurer

American Academy of Occupational Medicine, Statler Hotel Detroit Feb 8-10 Dr Paul J Whitaker Allis-Chalmers Mfg Co P O Box 512, Milwaukee 1, Secretary

American College of Radiology, Drake Hotel Chicago, Feb 8-11 William C Stronach, LL B 20 N Wacker Drive Chicago 6, Executive Director

American Urological Association Western Section, Hotel Sahara Las Vegas Nev Feb 6 9 Dr Edmund Crowley, 1930 Wilshire Blvd Los Angeles 57

Central Surgical Association, Park Plaza Hotel, St Louis Feb 16-18 Angus D McLachlin Victoria Hospital London, Ontario Canada Secretary

Congress on Medical Education and Licensure, Palmer House Chicago, Feb 4-7 For information write Mrs Ann Tipner A M A 535 N Dearborn, Chicago 10

Oklahoma Academy of General Practice Biltmore Hotel, Oklahoma City Feb 6-7 For information write Dr Leonard R Diehl 2925 N W 50th St, Oklahoma City Okla

Society of University Surgeons, University of Kansas Medical School, Kansas City, Kan Feb 9-11 Dr Ben Eiseman, 4200 E Ninth Ave Denver 20 Secretary

March

American Association of Anatomists, Palmer House Chicago Mar 28-31 Dr Louis B Flexner Dept of Anat School of Med Univ of Pa Philadelphia 4, *Secretary-Treasurer*

American College of Allergists, Statler Hilton, Dallas Tex Mar 12-17 Dr Howard G Rapaport, 16 E 79th St, New York City Secretary

American College of Surgeons, Sectional Meetings for Surgeons and Graduate Nurses Hotels Bellevue-Stratford Ben Franklin, and Sylvania, Philadelphia March 6-9 Dr William E Adams 40 E Erie St, Chicago 11, Secretary

American Orthopsychiatric Association, Statler Hilton New York City Mar 23-25 Dr Marion F Langer, 1790 Broadway, New York 19 Executive Secretary

American Surgical Association Boca Raton Hotel Boca Raton, Fla Mar 20-24 Dr W A Altemeier, Cincinnati General Hosp, *Cincinnati 29 Ohio*, Secretary

Dallas Southern Clinical Society Statler Hilton Hotel Dallas, Mar 20-22 For information write the Dallas Southern Clinical Society, 433 Medical Arts Bldg Dallas, Texas

Missouri State Medical Association, Hotel Muehlebach Kansas City Mar 18-21 Dr John I Matthews, 302 Bolivar, Jefferson City, Mo., Secretary

(Continued on page 46)

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Acanthosis Nigricans and Endocrine Disease

R. K. Winkelmann, M.D., S. Randolph Scheen Jr., M.D., and Laurentius O. Underdahl, M.D., Rochester, Minn.

Among 29 patients who had the blackish brown, verrucous lesions of benign pubertal or postpubertal acanthosis nigricans, there were 9 with endocrinopathy in the form of pituitary adenoma, Stein-Leventhal syndrome, Addison's disease, or diabetes mellitus. Of the nine, four were male and five female. The ages of these patients ranged from 14 to 39 years, congenital cases being excluded. Obesity was marked in some cases, but it was not a constant factor. Treatment of the endocrine disorder did not consistently affect the acanthosis nigricans although the patients were observed for periods up to 13 years.

Acanthosis nigricans is a symmetric, hyperpigmented, verrucous, and hyperkeratotic reaction of the folds of the skin that most clinicians associate with the presence of malignant tumors of internal viscera, particularly the stomach. More recently, it has been recognized that acanthosis nigricans may be hereditary or congenital.[1] In many instances, however, adult or juvenile benign acanthosis nigricans has been shown to have no relationship to either malignant growths or congenital occurrence. 'Pseudoacanthosis nigricans' is a term used for cases related to obesity and for many cases of unknown cause. Pseudoacanthosis nigricans is clinically and histologically indistinguishable from cases based on malignant disease or a hereditary cause.[2]

A large proportion of the cases occurring as benign acanthosis nigricans have their onset at puberty, and, for this reason, many of the original authors thought some metabolic fault must be related to the process. Others have attempted to prove or disprove this hypothesis, their work has been summarized by Rothman,[3] and by Sheldon and Curtis.[4] This cutaneous change has been associated with pituitary basophilism, pituitary adenomas of the eosinophilic type associated with gigantism and acromegaly, hypogonadotropic hypogonadism, Cushing's syndrome, Addison's disease, the Stein-Leventhal syndrome, hyperthyroidism, hypothyroidism, and diabetes mellitus. Some consider that the sporadic instances of endocrinopathy and obesity

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associated with acanthosis nigricans represent forms of pseudoacanthosis nigricans

In reviewing 22 cases at the Mayo Clinic, in 1947, Kierland[5] noted an unusual incidence of instances in which the presence of endocrinologic disease was either confirmed or suspected In further reviewing the material at the clinic, we wish to report those cases in which various types of endocrine disease were seen in association with acanthosis nigricans during the period from 1935 through 1956 Of 57 patients diagnosed as having acanthosis nigricans, 18 patients had associated malignant disease and 3 patients could not be followed, the remainder of the patients, who had follow-up studies, were considered to have benign acanthosis nigricans Seven of these patients experienced onset of the disease in infancy and were considered to have congenital acanthosis nigricans The remaining 29 patients had an onset at puberty or in young adulthood, and 9 of this group had associated endocrinopathy (see table)

Acanthosis Nigricans and Endocrine Disease Nine Cases

Case	Age, Yr	Sex	Duration, Yrs	Endocrine Disease	Additional Diagnosis	Follow up And Course
1	15	M	1	Gigantism (eosinophilic adenoma)	Diabetes	1959 (6 yr) unchanged
2	27	M	1	Acromegaly (eosinophilic adenoma)	Duodenal ulcer	1957 (13 yr) unchanged
3	28	F	1	Mixed adenoma of pituitary	Hypertrichosis, amenorrhea obesity	Died 20 mo later
4	34	F	1 to 2	Stein Leventhal syndrome	Hirsutism, obesity hypertension	1959 (2 yr) unchanged after wedge resection of ovaries
5	31	F	1 to 2	Stein Leventhal syndrome	Masculinization, diabetes, hirsutism	2 yr unchanged after 2 wedge resections of ovaries and dexamethasone (1959)
6	39	M	6/12	Addison's disease	Tuberculosis, obesity	No change with DOCA, salt streptomycin died 1 yr later
7	23	F	6/12	Addison's disease		1960 (9 yr) unchanged continued cortisone
8	31	M	1	Diabetes	Obesity	1956 (4 yr) unchanged hypertensive cardiovascular disease appeared
9	30	F	7	Diabetes	Obesity, hirsutism amenorrhea	1958 (17 yr) unchanged

A study of these nine cases comprises this report Results of routine laboratory examinations, including thoracic roentgenograms, hemograms, urinalyses, and serologic tests for syphilis, were within normal limits unless specifically recorded All blood sugars in these patients were measured by the Folin-Wu technique

Report of Cases

Case 1 Gigantism and Acanthosis Nigricans — A 15-year-old white boy was seen at the clinic in 1953 with a history of onset of rapid growth in 1950, he had gained in weight from 140 to 220 lb (64 to 100 kg) in one year He had noted enlargement of the hands and feet and a great increase in height A constant dull headache and severe fatigability were present No visual impairment was noted For one year, symmetric blackish-brown pigmentation with verrucal changes had been present on all the flexor surfaces of the body The neck, axillae, flanks, groins, umbilicus, popliteal spaces, and knuckles were involved (fig 1*a*) Biopsy had confirmed the impression of acanthosis nigricans

The patient was a well-proportioned boy 78 in (198 cm) tall and weighing 220 lb (100 kg) (fig 1*b*) The blood pressure was 118 mm of mercury systolic and 76 diastolic Except for the cutaneous changes, including some striae, physical examination showed no abnormalities Roentgenograms of the head and thorax and roentgenoscopic examination of the upper part of the gastrointestinal tract gave normal results The basal metabolic rate (BMR) was −16 per cent The value for serum phosphorus was 4 9 mg per 100 ml The urinary excretion of 17-ketosteroids was 7 8 mg per 24 hours, and that of corticosteroids was 1 17 mg per 24 hours (formaldehydogenic method, normal-0 4-1 mg [24 hr]) The funduscopic appearance and the perimetric fields were normal

A diagnosis of gigantism was made but, since he had not experienced any increase in height during the previous year, treatment was not given

A letter from his physician stated that in September, 1959, his height was 84 in (213 cm) with shoes, and his weight was 247 lb (112 kg) Diabetes also had developed, requiring up to 150 units of insulin per day During periods of strenuous exercise, such as in the basketball season, the dose of insulin dropped to zero, but it increased to high levels again with ordinary activity The letter indicated that the patient thought there had been some relationship beween increased or decreased pigmentation and increased or decreased requirements for insulin

Case 2 Acromegaly and Acanthosis Nigricans — A 27-year-old white man was seen at the clinic in 1944 because of progressive headaches for 1½ years, with increasing severity for 6 months At the same time, he had noted that his jaw was growing forward and that his hands and feet were becoming wider He had gained 60 lb (27 kg) in 2 years For 6 months there had been progressive weakness and numbness of both arms with use Shortness of breath had been present for 6 weeks Intermittently for one year, he had experienced postprandial epigastric pain but no associated nausea or vomiting

His height was 73½ in (186 cm), and his weight was 240 lb (109 kg) The blood pressure was normal Definite acromegalic features were present The remainder of the examination was normal except for an atrophic right testis The perimetric fields were normal

Roentgenograms of the skull displayed enlargement and ballooning of the sella turcica compatible with an intrasellar tumor Roentgenoscopic examination of the stomach revealed a duodenal ulcer The urinary excretion of 17-ketosteroids was 26 2 mg per 24 hours The BMR was +2 per cent He received roentgen therapy to the pituitary

At a return visit 1½ years later, no progression of the acromegalic features was noted Over a 10-month period, some pigmentation of the anterior axillary regions had developed The general physical findings at this time were essentially the same as in 1944, except for the skin Verrucous and hyperkeratotic, hyperpigmented cutaneous changes were noted in the axillae Many papillomas were found here and in the groin Biopsy confirmed the diagnosis of acanthosis nigricans A letter from his physician indicated that the acromegaly and acanthosis nigricans were unchanged at the time of examination in 1957

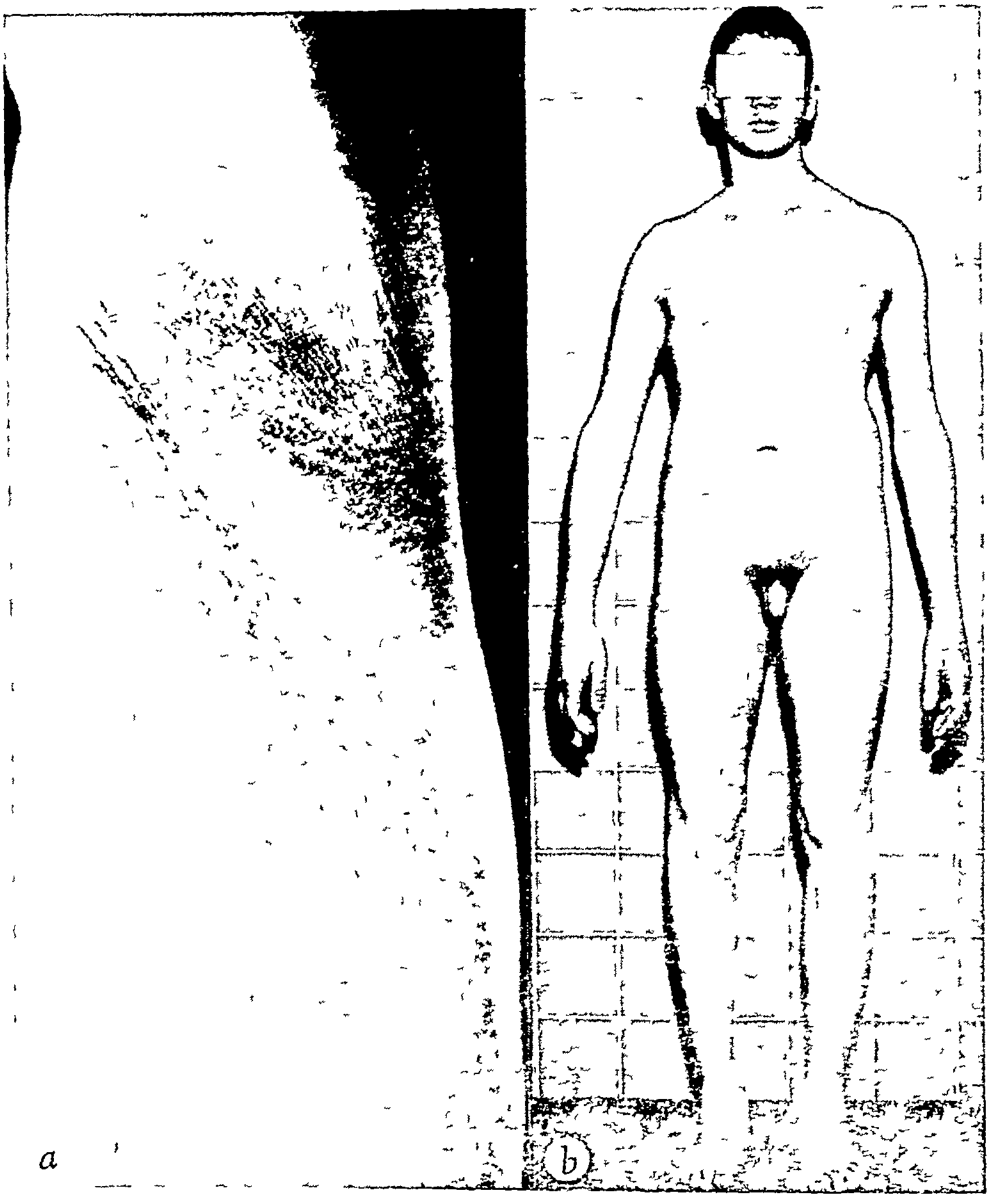

Fig 1 (case 1) —Fifteen year old boy with gigantism associated with acanthosis nigricans *a* Acanthosis nigricans in axilla Note epithelial hyperplasia *b* General appearance

Case 3 Pituitary Adenoma with Acanthosis Nigricans —A 28-year-old white woman was seen at the clinic in April, 1949, with the chief complaint of headache for one year and loss of vision for 6 months The right eye was blind and the left distinguished only light She had noted progressive ataxia of three months' duration, during the previous three weeks, she had experienced several jacksonian seizures. Her usual weight was 175 lb (79 kg) but she had lost 25 lb (11 kg) in a month. She never had menstruated and she was generally lethargic. No pertinent family history was elicited.

Her blood pressure ranged from 90 to 114 mm of mercury systolic and 64 to 76 diastolic. Pronounced hirsutism and a male escutcheon were present. The clitoris was of normal size. Asymptomatic lesions of acanthosis nigricans were present in the axillae and along the sides of the neck. The perimetric fields revealed the right eye to be blind, with only a small nasal field of vision remaining on the left.

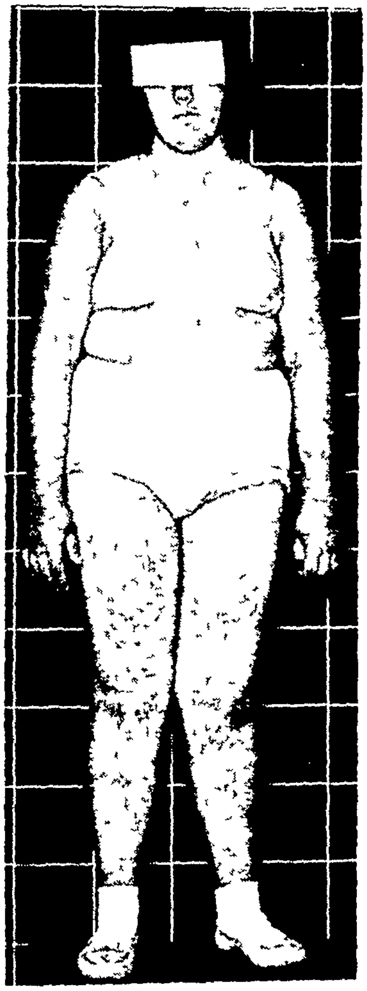

Fig 2 (case 4).—General physical features of obesity and hirsutism in 14-year-old girl with Stein-Leventhal syndrome.

The urinary excretion of 17-ketosteroids was 22.3 mg per 24 hours, and that of corticosteroids was 0.7 mg per 24 hours. Estrogen was not detected in the urine. The BMR was −28 per cent, and the value for plasma cholesterol was 187 mg per 100 ml. The blood sugar with the patient fasting measured 102 mg per 100 ml. Roentgenograms of the head revealed that the sella turcica was enlarged three times by an intrasellar tumor. The cerebrospinal fluid was normal.

Exploration of the intracranial lesion revealed a large inoperable pituitary adenoma of the mixed cell type. The patient died in January, 1951.

Comment.—In each of these three cases, the acanthosis nigricans apparently developed along with the signs and symptoms of the pituitary adenoma, although it was diagnosed subsequent to acromegaly in case 2. It is still present in the two living patients, although the pituitary hyperfunction apparently has ceased.

Case 4. Acanthosis Nigricans with Stein-Leventhal Syndrome.—A 14-year-old adopted white girl was seen at the clinic in August, 1957, because of obesity, listlessness, and hirsutism of the face and legs. The menarche was in 1956, she had had three normal periods, then had missed three months, and then had been regular to the time of examination.

She was severely obese, being 69 in (175 cm) in height and weighing 242 lb (110 kg) (fig 2). The blood pressure was 160/90 mm Hg. The hairline was low on the forehead, and she had advanced hirsutism, especially on the face. Severe acne was present on the face and back. Zones of symmetric pigmentation and acanthosis nigricans were found in the axillae, below the breasts, along the perineum and over the neck. Her clitoris was slightly enlarged.

Results of hormonal studies, including urinary 17-ketosteroids, corticosteroids, estrogens, and pregnanetriol and plasma cortisol, were within normal range. Values for blood sugar, blood electrolytes, serum calcium, and protein-bound iodine also were normal. Buccal smears showed a female chromatin pattern. Roentgenograms of the head and thorax were normal. Roentgenologic studies of the wrist disclosed that the bone age was compatible with the chronologic age.

Exploration of the adrenals and ovaries was advised. She did not return for this until 11 months later (July, 1958), during this interval she had only three or four menstrual periods but otherwise the clinical picture remained unchanged. At operation, the adrenals were normal to palpation. The gross appearance of the ovaries suggested a diagnosis of the Stein-Leventhal syndrome, and the histologic examination was consistent with this. Bilateral wedge resection of the ovaries was performed. The latest follow-up report was by letter six months after operation, there had been no menses for three months following three relatively normal periods after operation.

Case 5. Acanthosis Nigricans with Stein-Leventhal Syndrome, Masculinization, and Diabetes Mellitus.—A 31-year-old white woman came to the clinic in November, 1958, for the problem of infertility. After menarche at the age of 14 years, she had had regular periods until the age of 18, at which time she noted the onset of irregular menses, periods of amenorrhea and progressive hirsutism. Four years before her examination at the clinic, wedge resection of polycystic ovaries had been done without improvement. Her periods had ceased completely 1½ years before our examination Six months of cortisone therapy had not helped

She was 64 in (163 cm) tall and weighed 130 lb (59 kg) The blood pressure was 150/96 mm Hg She was a masculine-appearing young woman, with shaved hair on the chin, increased hair on the extremities and a male escutcheon (fig 3*a*) Her clitoris was slightly enlarged Acanthosis nigricans (present for one to two years) was noted in the axillary region and groin (fig 3*b*)

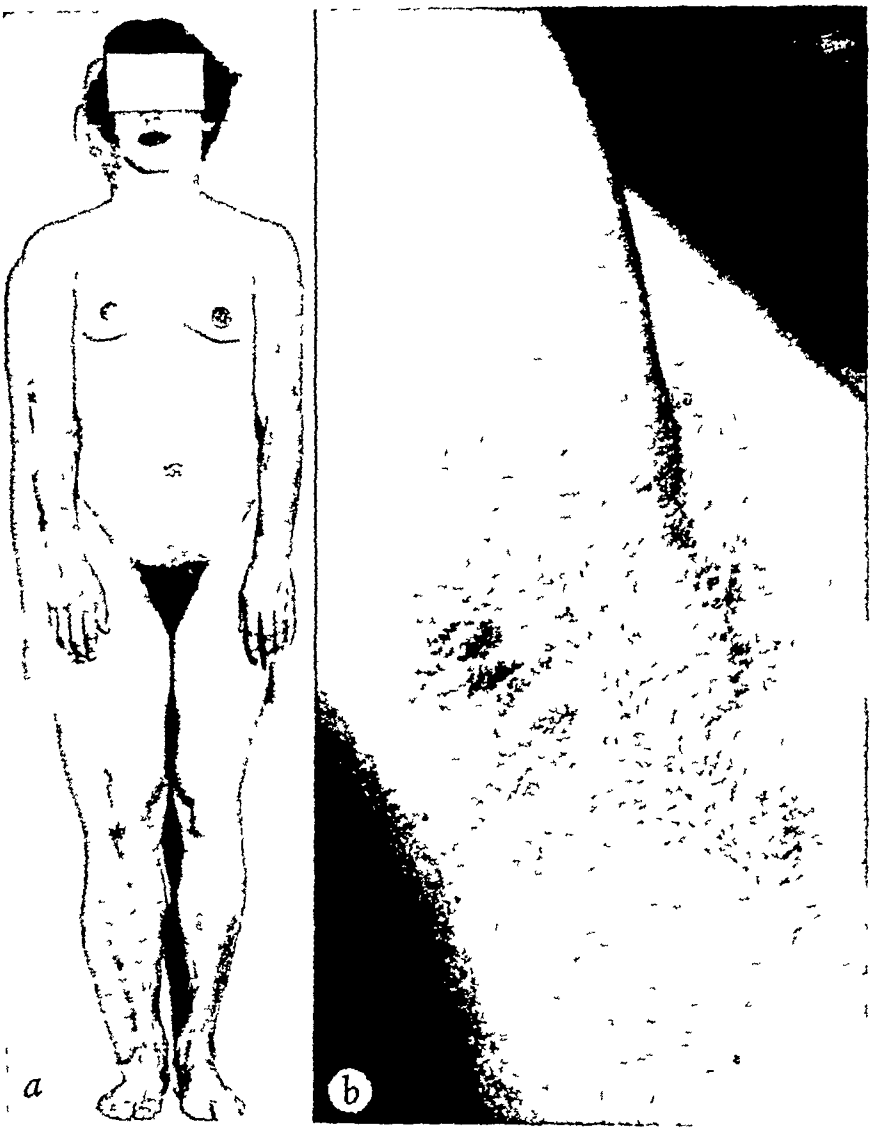

Fig 3 (case 5) —Thirty one year-old woman with polycystic ovaries and acanthosis nigricans *a* Note masculine body features and hair distribution *b* Axillary acanthosis nigricans, velvety verrucous epidermal change is important

The urinary excretion of 17-ketosteroids and corticosteroids and the level of plasma cortisol were normal and were suppressed normally to lower values after administration of dexamethasone The level of pregnanetriol and pituitary gonadotropin in the urine was normal but that of the estrogens was somewhat increased, being 86 rat units per 24 hours An excretory urogram was normal, as was a roentgenogram of the head The blood sugar under fasting conditions was 211 mg per 100 ml

At operation, the adrenal glands were estimated to be of normal size and no tumor could be palpated in them The left ovary was larger and firmer than normal and was removed The histologic appearance was consistent with the diagnosis of the Stein-Leventhal syndrome A trial of adrenal suppression was instituted with dexamethasone Her diabetes was treated with diet and insulin

She returned one year later with essentially the same clinical picture Excretion of 17-ketosteroids had been held to less than 4 mg per 24 hours by administration of 0 25 mg of dexamethasone twice a day She had had normal menses in March and April, 1959, for the first time in two years but none since No change in hirsutism, habitus, or the acanthosis nigricans had occurred The blood pressure was still mildly increased (150/100 mm Hg) An additional wedge resection of the remaining ovary was performed, and the histologic picture again was that of the Stein-Leventhal syndrome She was advised to continue use of dexamethasone

Comment—Although both of these last patients displayed hirsutism and had polycystic ovaries, one was obese and the other was slender and considerably masculinized Obesity did not appear to be a variable of importance here, for the acanthosis nigricans was equal in both Wedge resection of the ovaries apparently has not changed the hirsutism or the acanthosis nigricans in either patient

Case 6 Addison's Disease with Acanthosis Nigricans—A 39-year-old white man came to the clinic in May, 1947, with a 3-year history of recurrent fever and loss of weight Right orchiectomy had been performed in January, 1945, for a "hard and swollen" testis In March, 1947, frequent attacks of nausea, vomiting, and evening fever had developed General fatigue, lassitude, and loss of potentia and libido had been noted Increasing pigmentation had been present about the face, neck, hands, and genitalia for six months

Although he still weighed 265 lb (120 kg), his usual weight was 325 lb (147 kg) The blood pressure was 82/64 mm Hg Hyperpigmentation of the face, neck, nipples, hands, pressure points, genitalia, and the perianal area was present Acanthosis nigricans of the axillae was verified by biopsy

The urinary excretion of 17-ketosteroids was 2 8 mg per 24 hours The blood sugar measured 107 mg, and the BMR was +1 per cent The erythrocytic sedimentation rate varied from 110 to 124 mm during the first hour (Westergren method) Values for blood urea originally were 54 and 60 mg per 100 ml, decreasing subsequent to treatment to 26 mg Expressed as milliequivalents per liter, the serum sodium was 120, potassium 5 3, and blood chlorides 92 The Robinson-Kepler-Power water test gave positive results for Addison's disease Roentgenograms of the thorax revealed a Ghon complex and slight elevation of the diaphragm Histologic study of the previously removed testis disclosed tuberculosis of the testis

He was treated with aqueous adrenal cortical extract, 10 ml twice a day, with good symptomatic response, medication then was changed to 2 5 mg of desoxycorticosterone acetate given intramuscularly each day and 5 Gm of extra salt Because of the probability that he had active tuberculosis, including that of the adrenals, he also was started on a program of streptomycin He was dismissed in July, 1947, and he died at home in January, 1948

Case 7 Addison's Disease with Acanthosis Nigricans—A 23-year-old woman was seen at the clinic in August, 1951, with a complaint of fatigue for 6 months During the preceding winter, she had noted new dark freckles and also that she had not lost the tan acquired in the summer of 1950 In July, 1951, her home physician made a diagnosis of Addison's disease and started treatment with desoxycorticosterone acetate, with symptomatic improvement She was referred here for further confirmation of the diagnosis

She weighed 135 lb (61 kg) and her height was 65½ in (166 cm) The blood pressure was 110/78 mm Hg Increase in pigmentation corresponded to areas exposed to the sun, except for that of the mouth, palmar creases, and axillae She also had dark freckles on the face and shoulders Clinical and microscopic examination of axillary skin revealed acanthosis nigricans

The urinary excretion of 17-ketosteroids was zero, and that of corticosteroids was 0 49 mg per 24 hours Serum potassium was 6 3 mEq and sodium 134 mEq per liter A differential count revealed a lymphocytosis of 49 per cent Results of the Cutler-Power-Wilder salt-deprivation test and the Robinson-Kepler-Power water test confirmed the diagnosis of Addison's disease She was given daily doses of 2 5 mg of desoxycorticosterone acetate and cortisone therapy Her physician reports that she subsequently has had two successful pregnancies and is continuing on replacement therapy for the Addison's disease

Comment—Because of the hyperpigmentation in Addison's disease, the diagnosis of acanthosis nigricans may be difficult and often overlooked The important feature is the epithelial verrucous change that must be present for the diagnosis of acanthosis nigricans Verification by biopsy is important One of these last two patients was obese and one was not, so that this is not a definite relationship

Case 8 Acanthosis Nigricans with Diabetes Mellitus—A 31-year-old white man was referred to the clinic in April, 1952, with the diagnosis of acanthosis nigricans He had been completely well until 1947 From that time to this visit, he had gained 120 lb (54 kg) He had noted pigmentation and thickening in his axillae for one year and a similar change on his neck and about the dorsum of his hands for three to four months Biopsy done by his local dermatologist confirmed the clinical impression of acanthosis nigricans A temporary loss of weight up to 60 lb (27 kg) had not changed the cutaneous picture

The patient was 69½ in (176 cm) tall and weighed 290 lb (132 kg) The blood pressure was 140/100 mm Hg Results of routine laboratory work were normal Excretory urography, a cold pressor test and histamine tests for pheochromocytoma gave normal findings Roentgenoscopic examination of the esophagus, stomach, and duodenum showed no abnormalities Excretion of 17-ketosteroids was 15 mg per 24 hours, and that of corticosteroids was 0 06 mg The BMR was −3 per cent Slight frontal hyperostosis was noted on roentgenograms of the head

A follow-up letter indicated that diabetes developed in 1955, and the patient has required 80 units of isophane (NPH) insulin for control Hypertensive cardiovascular disease with severe frontal headaches and intermittent clouding of vision also developed The blood pressure was 210/130 mm Hg

Case 9 Acanthosis Nigricans with Diabetes Mellitus—A 30-year-old white woman came to the clinic in August, 1941, with a chief complaint of intermittent amenorrhea for 11 years She had had a total of five periods from 1930 through 1936 and none since that time From 1931 to 1932 she had gained in weight from 150 to 220 lb (68 to 100 kg) She had noted excessive growth of hair on the face for 11 years For seven years, pigmented verrucous changes on the inner surfaces of the thighs had been noted, similar changes on the back, neck, and thorax had been present for three months

Examination disclosed a male distribution of hair Her height was 64½ in (163 cm) and she weighed 200 lb (91 kg) The blood pressure was 136/80 mm Hg Acanthosis nigricans was present in the axillae, neck, and groin, with many papillomas Roentgenograms of the head were essentially normal The BMR was +11 per cent, and the blood sugar measured 85 mg

Although the 17-ketosteroids were within normal range, the clinical picture suggested the presence of an adrenal cortical tumor, and adrenal exploration was done through bilateral posterolumbar incisions The adrenals were of normal size and appearance, and no tumor was found The pelvic organs were palpated through the right posterolumbar incision, the uterus was small and the ovaries were cystic and twice normal size She was advised to return in three months for exploration of the ovaries through an abdominal incision

In April, 1952 (11 years later), the patient returned, stating she had had no menses for 6 years after being here but then had experienced regular periods from 1947 up until her last one in October, 1951 Nocturnal lower abdominal pain had been present for six months In 1950, the patient had gone to her physician because of dryness of the mouth, perspiration, polyuria, nocturia, and polydipsia A diagnosis of diabetes was made She had been given a 1200 calorie diet and a combination of 24 units of regular and 10 units of protamine zinc insulin daily Her weight had decreased from 210 to 160 lb (95 to 73 kg)

Examination showed the acanthosis nigricans to be unchanged as compared with the condition in 1941 The uterus was the size of a 4½-month pregnancy, and fetal heart tones were heard The blood sugar while she was taking insulin measured 78 mg

A follow-up letter in 1958 revealed that she had delivered a normal baby girl in August, 1952, and had experienced miscarriages in 1953 and 1955 She was taking 25 units of isophane insulin, and the blood sugar in September, 1958, had been 217 mg

Comment—In these last two cases, diabetes developed after the diagnosis of acanthosis nigricans had been made This precludes any etiologic relationship, however, since two other patients (cases 1 and 5) also had diabetes at a later time, the combination has been considered clinically interesting

General Comment

Endocrinopathy occurring in association with acanthosis nigricans may be present in young adults of both sexes In the past, it has been thought that the incidence of juvenile acanthosis nigricans was greater in females While our group of patients is small, both sexes were about equally represented in those having endocrinopathy In malignant acanthosis nigricans, the sex distribution is equal

Since endocrine disease developed in 9 of 29 cases of benign pubertal and postpubertal acanthosis nigricans, it appears wise to keep in mind such a relationship, which may be useful clinically even if it is not understood The seven patients who had congenital acanthosis nigricans did not show any signs of endocrine disease, which contrasts to the data in other case reports Congenital acanthosis nigricans as used here refers to the state having been present from infancy

A report by Rothman [3] of pituitary basophilism found at necropsy in a case of juvenile acanthosis nigricans renewed interest in the relationship of pituitary function and acanthosis nigricans Matras [6] and Perman [7] both recorded cases of acromegaly associated with acanthosis nigricans Watson Smith [8] and Curth [2] both discussed cases of gigantism associated with acanthosis nigricans Curth referred to her case of gigantism as demonstrating pseudoacanthosis nigricans and implied that it was secondary to obesity Marañon and Alvarez-Cascos [9] reported a case of diabetes insipidus with acanthosis nigricans, but it also was associated with infantilism, arachnodactyly, and multiple nevi, and probably was of congenital origin Our cases of pituitary adenoma with acanthosis nigricans bring the total reported to eight

To our two cases of the Stein-Leventhal syndrome, one may add the case reported by Curth and Aschner,[1] which was considered by them to be on the basis of a congenital defect A distant maternal relative had Stein-Leventhal disease and some paternal relatives were known to have acanthosis nigricans No such familial history was available in either of our patients Similarly, there are few cases of adrenal disease reported with acanthosis nigricans Cases of Cushing's disease have been reported by Curth [2] and by Bettley,[10] and an additional case of adrenal hyperplasia has been documented by Azerad and Grupper [11] In Curth's case the acanthosis nigricans went into remission after left adrenalectomy and roentgen treatment of the pituitary Our two examples of Addison's disease indicate that adrenal insufficiency may be seen with acanthosis nigricans as well Care must be taken in the differential diagnosis of Addison's disease and acanthosis nigricans, for hyperpigmentation is common to both

Diabetes was present in 7 of 10 cases from the literature on juvenile acanthosis nigricans collected by Robinson and Tasker [12] Two families with congenital acanthosis nigricans and diabetes have been reported [13] Four of our patients had diabetes, two of these patients had it in conjunction with other endocrine disease In the case reported by Sheldon and Curtis,[4] diabetes was associated with hypogonadism Obesity is known to have a high correlation with diabetes, and this may be the significance of the association of acanthosis nigricans and diabetes, however, two of our patients (cases 1 and 5) were not obese As the diabetes developed after the acanthosis nigricans, it is not of etiologic significance, but patients with this cutaneous disorder should be watched for development of diabetes

Four of our five female patients had definite hirsutism In addition, three had presenting complaints of amenorrhea, and obesity was present in three This triad of obesity, hirsutism, and amenorrhea in young females is frequently recorded in the literature on juvenile acanthosis nigricans A number of the 20 patients with benign acanthosis nigricans and without demonstrable endocrine disease had these clinical features Such additional clinical characteristics as moon facies, acne, and cutaneous striae were common The initial clinical impressions concerning many of these patients included Cushing's disease and the Stein-Leventhal syndrome Every effort was made to demonstrate definite endocrine disease in these patients without success, and two underwent adrenal exploration because of the clinical suspicion of adrenal hyperplasia or tumor These cases of benign acanthosis nigricans will be reported in detail elsewhere

Hellerstrom [14] stated that castration produced amelioration of diabetes as well as of acanthosis nigricans in one patient Curth noted remission with adrenalectomy and pituitary roentgen therapy It should be noted further that many patients with acanthosis associated with malignant lesions have shown carcinomatosis of the adrenals at necropsy Replacement therapy for endocrine disease, as with insulin or corticosteroids, apparently did not influence the acanthosis nigricans, except as noted in case 1 Loss of weight in cases 8 and 9 did not affect the acanthosis either

Summary

Acanthosis nigricans may occur in patients with a variety of endocrine diseases, including pituitary adenomas, polycystic ovaries, adrenal insufficiency, and diabetes This association was present in 9 of 29 cases of benign acanthosis nigricans occurring in young adults studied at the Mayo Clinic Obesity was not a constant factor Treatment of the endocrine disorder did not produce a consistent change in the acanthosis nigricans

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Confluent and Reticulated Cutaneous Papillomatosis

Report of a Case and Commentary

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A 22-year-old negroid man complained of a skin eruption which had been present for two years The initial lesions were minute papules confined to the pectoral regions, later they had spread to the trunk, shoulders, and extremities They were numerous round to oval papulosquamous lesions, 0 5 to 2 0 mm in size They were absent in the axillae, in the groin, and on the scalp, palms, and soles Around the neck and upper chest they were confluent and reticulated There were many glistening minute papules on the hard palate There were keratotic follicles on the extensor surfaces of all extremities The dermatosis described was the only physical abnormality in an otherwise healthy man

IN 1927 Gougerot and Carteaud[1] reported on a 27-year-old woman with a papillomatous eruption of the intermammary region It had become confluent and reticulated and had spread to the intergluteal and crural folds during the 16 years it had been present They applied the descriptive term, "papillomatose pigmentee innominee," to the dermatosis The following year, under the title "Papillomatose pigmentee confluente and reticulee," they reported on a similar condition in a woman aged 25 years[2] Two other reports followed[3]

In 1932 the two observers, in order to differentiate pigmented cutaneous papillomatosis from other verrucous proliferative dermatoses, proposed the following classification of the three known forms[4] (1) punctate pigmented verrucous papillomatosis, (2) confluent and reticulated papillomatosis, and (3) nummular and confluent papillomatosis Since that time no reports of group 1 have been published in the American literature and only one case of group 3[5]

Gougerot and Carteaud believed that the first observable lesion of the reticulated type (group 2) was a papule, 1 to 2 mm in diameter, discrete, round, and reddish in color This quickly becomes grayish in color, and then brown, and enlarges to 4 or 5 mm The cornified surface then becomes uneven, verrucous and friable, and consequently develops a resemblance to a flat wart As the lesions increase in number and size, they may merge, the center of the involved area demonstrating a uniformly even surface and the periphery a pigmented network The condition at this stage may become confluent and resemble a superficial fungus infection, particularly tinea versicolor The initial lesions are usually in the intermammary and epigastric regions, with subsequent spread to the interscapular area The shoulders may also be sites of predilection Involvement of the neck, axillary, pubic, intergluteal, and sacral regions may occur Hyperplastic parallel folds and keratinous follicles may be seen in the axillae The skin of the neck may become rough, dark, and thick

Histopathologically, hyperkeratosis is observed with thinning of the granular layer The epidermis may be acanthotic, with occasional anastomosis of the ridges, or there may be atrophy and irregular thinning Normal palisading of the basal cell layer may be absent and diminution may be noted in the intercellular bridges Moderate edema of the cutis, papillomatosis, vascular dilatation, and a perivascular infiltrate are relatively constant findings Diminution of sweat glands may occur

In their review of the literature in 1957, Kesten and James[6] assembled reports of 21 cases in the world literature and presented four not previously recorded Cases had also been presented by Leavitt[7] and described by Bell[8] The latter case was reported in 1957 (fig 1)[9]

Report of a Case

A 22-year-old negroid patient exemplifying the characteristics described by Gougerot and Carteaud is reported herewith (fig 2) He was first seen at the U S Naval Hospital, Key West, Fla, on Feb 24,

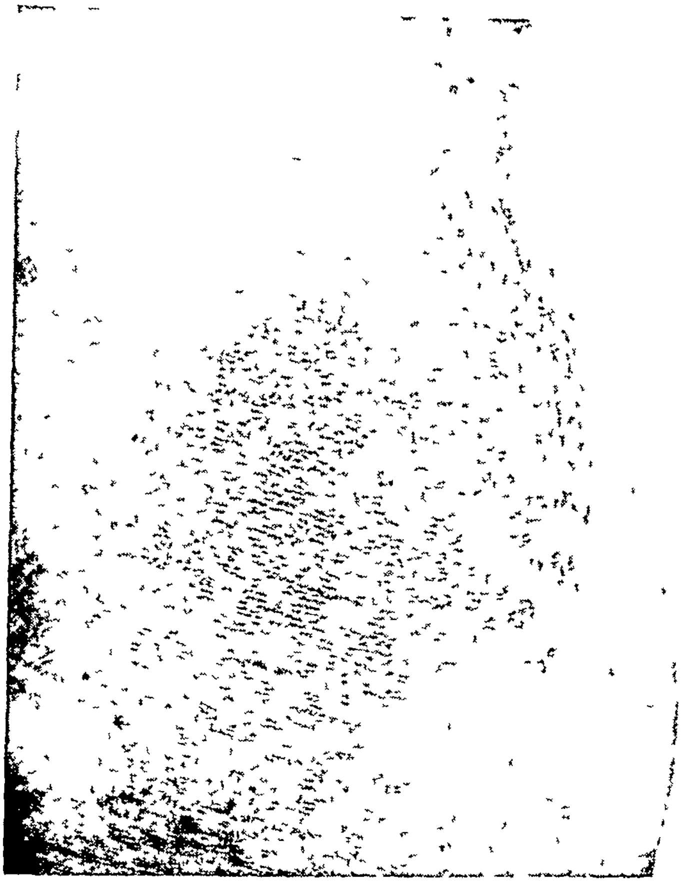

Fig 1—Typical lesions on trunk, variation in degree of pigmentation contributing to reticulation is evident

1959, complaining of a skin eruption which had been present for two years The initial lesions were minute papules and had remained confined to the pectoral regions until recently, when they had spread to the trunk, shoulders, and extremities No significant information could be found in the family history, and the patient's history had likewise been essentially noncontributory His development had been normal and he had attained the height of 73 in (186 cm) and the weight of 165 lb (75 kg) at the age of 19 years He remained single, but no evidence to suggest endocrine imbalance could be elicited on direct questioning

Findings on physical examinations were essentially normal, with the exception of the skin His dermatosis involved the base of the neck, the chest, the shoulders, and the lower trunk The axillae and the groin were clear, as were the scalp, palms, and soles There were numerous round to oval papulosquamous lesions 0 5 to 2 0 mm in size, which tended to follow the lines of cleavage Around the neck and upper chest they were confluent and reticulated, and because of the distribution of pigment gave the skin a striated appearance Striae albicantes were present on the thighs There were many glistening minute papules on the hard palate The mucous membranes were otherwise uninvolved Keratotic follicles were noted on the extensor surfaces of all extremities

The scrapings of the involved areas did not demonstrate fungous elements The complete blood count and differential cell count were normal as was the urinalysis Roentgenographic examination of the chest revealed no evidence of abnormality of heart, lungs, pleura, or bone

Biopsy from the pectoral area was examined at varying levels in the block of tissue (fig 3) There were hyperkeratosis and acanthosis Some regions were minimally verrucous and covered by a moderately increased loosely laminated horny layer The granular layer was diminished There was focal acanthosis with variation of width and depth of the rete ridges and occasional fusion The palisading of the basal cell layer was uneven in some areas Edema of the papillary layer of the corium was noted, and vessels were slightly dilated A lymphocytic perivascular infiltrate was observed in the upper corium The collagen and adnexa appeared normal

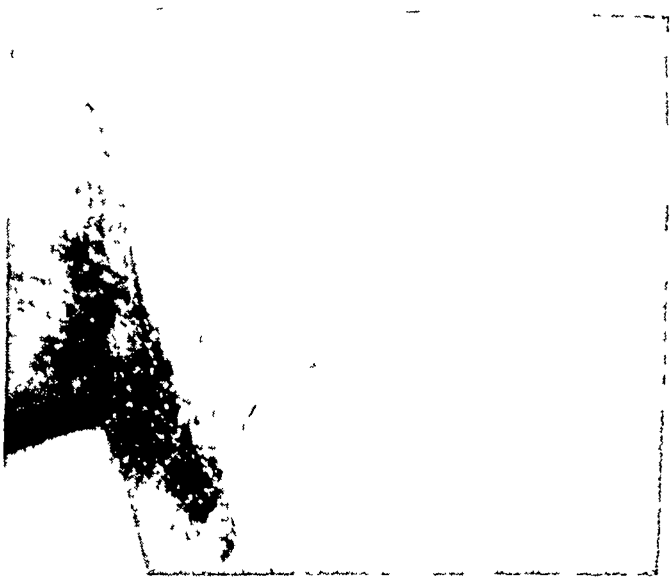

Fig 2—Lesions are dispersed over trunk, confluent reticulation prominent

Comment

Five types of cutaneous papillomatosis other than those described by Gougerot and Carteaud must be considered when one deals with a case of persistent pigmented papules The most important are the various forms of acanthosis nigricans [10] In that type, associated with malignancy, the cutaneous involvement may occur at any age but usually after puberty The changes may precede the appearance of the malignancy, occur concurrently, or develop after its presence is known They may improve after extirpation of the neoplasm

In pseudoacanthosis nigricans Curth [11] described a nonhereditary condition in patients in whom endocrine imbalance may not be present This dermatosis occurs in the body creases in obese brunet or negroid persons A marbled or reticulated pattern may be seen on the trunk It is apparently related to maceration, friction, and perspiration, as it disappears with weight loss or when other factors operating in its genesis are eliminated In some cases prolonged observation may be necessary to distinguish this disorder from the acanthosis nigricans which accompanies malignancy, since morphologic and histological differences may be only quantitative Waisman[12] believes that pseudoacanthosis nigricans and confluent and reticulated cutaneous papillomatosis are the same disease

The entity benign or juvenile acanthosis nigricans[10b] may begin at birth, childhood, or puberty It is a genodermatosis commonly associated with obesity Endocrinologic abnormalities, usually associated with pituitary disease, have been observed, however, this disorder commonly regresses after puberty Curth[10b] believes that the physiological imbalance of the steroid hormones at puberty is the decisive factor in the activation of the dermatosis and that the lesions subside with the regression of this imbalance If the endocrine imbalance persists, the skin changes may persist beyond puberty[13] Three cases of the juvenile type reported by Rothman,[13a] Sheldon and Curtis,[13b] and Kesten[6] were held to be pseudoacanthosis nigricans by Curth[6]

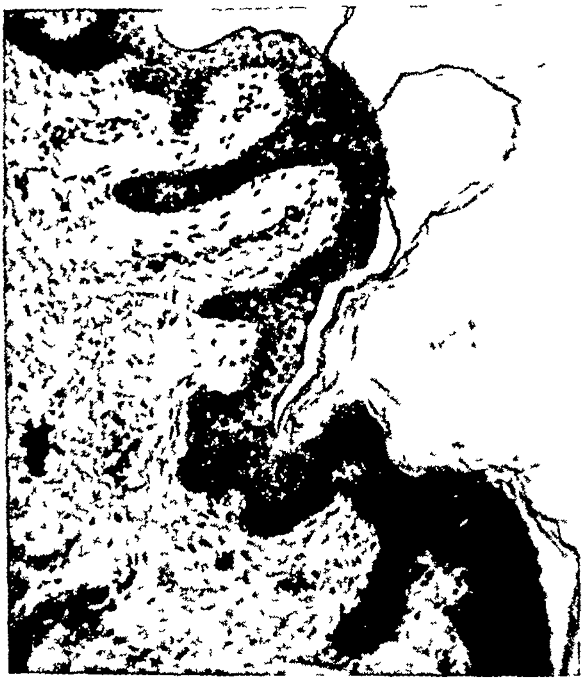

Fig 3—Horny layer is thickened loosely laminated and minimally verrucous Epidermal ridges vary in width and depth and occasionally fuse Palisade layer is uneven but intact There is edema and lymphocytic infiltrate af the cutis

Pseudoatrophoderma colli is a papillomatous and pigmented dermatosis involving the neck and upper thorax It was first described by Becker and Miller[14] Their fourth patient, described in detail, had the involved portions of the epidermis thrown up into pigmented folds, which could be obliterated by traction Glossy areas were present and appeared to be atrophic Because of the difference in light reflection these areas appeared to be depigmented The pseudoatrophic plaques tended to become arranged in a vertical direction The light areas, more apparent than real, superficially resembled vitiligo Microscopically the findings were essentially those of confluent and reticulated cutaneous papillomatosis Kesten and James have assembled nine reports of pseudoatrophoderma colli in caucasoid women, one of Mexican ancestry Only one of these was obese and only one had a suspected endocrine imbalance (hypothyroidism), two were sisters, and one patient had a family history of palmar and plantar hyperkeratosis

A form of pigmented papillary dystrophy has been described by Arguelles Casals[15] This condition, observed in three Cuban women, involved the nuchal region in all cases, the axillae in two, and the inguinocrural region in one He felt that it was a physiological change, not to be confused with acanthosis nigricans Curth[10b] believed that the changes this author described are those of pseudoacanthosis nigricans and credited him with the first discussion of this entity

Summary and Conclusions

The persistent pigmented papillary dermatoses include pseudoacanthosis nigricans, pseudoatrophoderma colli, and true acanthosis nigricans Histopathologically, the changes seen in all these conditions are qualitatively similar The significance of the differential diagnosis of these conditions cannot be minimized, since their precise delineation can mitigate to various degrees against implications of malignancy

An astute division of the two types of acanthosis nigricans likewise is essential, inasmuch as further study of the patient is unnecessary if exoneration of malignant acanthosis is feasible The most noteworthy of the characteristics narrowing the field of consideration in true acanthosis are the age of the patient at onset and presence of lesions in other members of the family In malignant acanthosis nigricans the patient has probably not had the lesions in puberty

If malignant acanthosis nigricans cannot be reasonably deleted, its continued existence is invariably indicative of potential neoplasia Since many years may elapse before the carcinoma manifests its presence, close and unremitting observation is mandatory

The opinions or assertions contained in this report are the private ones of the writers and are not to be construed as official or reflecting the view of the Navy department or the Naval services at large

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WATER OF IMMORTALITY—"Aqua vitae is commonly called the mistress of all medicines," Hieronymus Brunschwig, the titan of fifteenth-century German medicine, surgery, and pharmacology, proclaimed "It eases the diseases coming of cold It comforts the heart It heals all old and new sores on the head It causes a good color in a person It heals alopecia and causes the hair well to grow, and kills lice and fleas It cures lethargy Cotton wet in the same and a little wrung out again and so put in the ears at night going to bed, and a little drunk thereof, is of good against all deafness It eases the pain in the teeth, and causes sweet breath It heals the canker in the mouth, in the teeth, in the lips, and in the tongue, when it is a long time held in the mouth It causes the heavy tongue to become light and well-speaking It heals the short breath It causes good digestion and appetite for to eat, and takes away all belching It draws the winds out of the body It eases the yellow jaundice, the dropsy, the gout, the pain in the breasts when they be swollen, and heals all diseases in the bladder, and breaks the stone It withdraws venom that has been taken in meat or in drink, when a little treacle is put thereto It heals all shrunken sinews, and causes them to become soft and right It heals the fevers tertian and quartan It heals the bites of a mad dog, and all stinking wounds, when they be washed therewith It gives also young courage in a person, and causes him to have a good memory and remembrance It purifies the five wits of melancholy and of all uncleanness" Brunschwig's proclamation includes, however, a cautionary note "It is to be drunk by reason and measure," he warned "That is to understand, five or six drops in the morning, fasting, with a spoonful of wine"—B Roueché Neutral Spirit Portrait of Alcohol, Boston, Little, Brown and Company, 1960

Heparin Versus Heparin-Bishydroxycoumarin Anticoagulant Therapy

Comparison in Patients with Acute Complicated Myocardial Infarction

George C Griffith, M D , Willard J Zinn, M D , Hyman Engelberg, M D ,
James V Dooley, M D , and Richard Anderson, M D , Los Angeles

Thrombotic complications dominated in the group treated with bishydroxycoumarin (12, compared to 5 in the heparin group) Embolic complications predominated in those treated with heparin (five, compared to one in the bishydroxycoumarin group) Of 52 patients receiving adequate bishydroxycoumarin therapy, 16 died, 8 in the group of 12 died while receiving inadequate therapy Of 75 with adequate heparinization, 16 died 12 out of 25 died with inadequate heparin therapy Three or more complications were followed by death in 11 of 19 given bishydroxycoumarin and 14 of 60 given heparin

FOR several years bishydroxycoumarin (Dicumarol suppression of prothrombin concentration throughout the hospital stay of a patient with myocardial infarction has been a standard procedure at the Los Angeles County Hospital For the period prior to adequate prothrombin suppression, intramuscular or intravenous heparin has been given in 50-mg doses at four-hour intervals Recently, concentrated aqueous heparin (200 mg or 20,000 units per cubic centimeter) has been found to prolong clotting time significantly for 10- to 12-hour periods

The present work was an attempt to compare practical anticoagulation with bishydroxycoumarin and with concentrated aqueous heparin in patients with myocardial infarction We also wished to compare mortality and morbidity, and to test the practicality of the two agents in a crowded, understaffed, large county hospital

The use of continuous heparinization for three to four weeks in patients with acute myocardial infarction has been reported,[1] [2] but, to our knowledge, this is the first comparative study of this disease using different anticoagulant modalities

Methods and Materials

Only severe cases of acute coronary occlusion were included in this study Therefore the patients had to meet the following requirements 1 An electrocardiographically proven acute myocardial infarction had to be present 2 One or more of the following conditions complicating the situation had to be present at the time of entry to the hospital shock, serious arrhythmia (multiple ventricular premature beats, ventricular tachycardia rapid supraventricular tachycardia, rapid sudden atrial fibrillation, 2 1 or 1 1 block with atrial flutter, or second or third degree heart block), prolonged angina, heart failure or acute pulmonary edema, hypertension, diabetes, or a known previous infarction

The heparin group received the medication subcutaneously every 12 hours The dose given was arbitrarily set at 100 mg per injection in order to minimize the possibility of bleeding (The initial dose was occasionally 150 to 200 mg) We are aware that in heavier patients a larger dosage, usually 150 mg every 12 hours, may be needed to maintain clotting times at two to three times control values for 12 hours after each injection However, with a resident and attending staff relatively untrained in the technique of continuous heparinization, it seemed important to us to avoid the high peaks of anticoagulant activity which may

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Professor of Medicine (Cardiology) (Dr Griffith) and Associate Clinical Professor of Medicine (Dr Zinn), University of Southern California School of Medicine Associate in Medicine (Dr Engelberg) Cedars of Lebanon Hospital and residents (Dr Dooley and Dr Anderson) Los Angeles County Hospital occur for several hours after the larger doses are given These prolonged clotting times (one to two hours) frequently occasion concern, although it has been demonstrated that they can be ignored[3] Nevertheless, we preferred the smaller dose in the circumstances of this study The bishydroxycoumarin (Dicumarol) group was given intravenous heparin and bishydroxycoumarin on admission, and the administration of heparin was continued (usually for two to four days) in 50-mg doses, intravenously, every four hours until the bishydroxycoumarin had lowered the prothrombin concentration to 20 per cent or below (Ware-Stragnell technique)[4] Bishydroxycoumarin was then continued alone for the remainder of the three- to four-week hospital stay

TABLE 1 —Admission Characteristics of Patients Receiving Anticoagulant Therapy

	Heparin	Bishydroxy-coumarin
Total episodes	100	64
Patients with three or more complications	60	19
Sex		
Male	54	40
Female	46	24
Age		
Mean, Yr	68	69
Range, Yr	44 87	47 95
Complications on Admission As Percentage of Total Illness		
Hypertension	27	14
Diabetes	17	27
Heart failure	66	59
Severe arrhythmia	56	27
Severe angina	39	22
Previous infarct	45	26
Shock	19	5

Although it would have been ideal to allocate subjects alternately into the two therapeutic groups—and this was attempted—it was not possible to do so in this extremely active county hospital First, patient care on each ward was the direct responsibility of the house and attending staff who, in actual practice, decided which type of anticoagulant therapy would be followed Thus, of the 163 patients in the study, 100 received heparin throughout the acute illness, and 64 were in the heparin plus bishydroxycoumarin group (one patient was treated during two infarctions) Second, an important difference between the two groups resulted from the fact that the residents increasingly assigned patients with multiple complications on admission to the heparin group Third, although the basic anticoagulant programs outlined were usually followed, in the event of minor bleeding or excessively elevated clotting times the decision as to resumption of anticoagulant drugs was made by the ward staff This occasionally resulted in inadequate therapy which will be discussed later

Capillary-tube clotting times, Lee-White clotting times, the antilipemic efficiency of the heparin, and prothrombin determinations were followed In the heparin group clotting times were determined frequently in a small number of patients and sporadically in the majority, particularly after the first week of therapy In the bishydroxycoumarin group, prothrombin times were done daily and the subsequent dose varied accordingly The final determination of the adequacy of the anticoagulant therapy in each patient was made by the authors upon review of the hospital chart after discharge When death occurred in the first 48 hours after admission, the case was dropped from the study as therapy in the initial two days included heparin in both groups

Results

Table 1 shows the composition of the two groups and the frequency of the various complications on admission It is apparent that the patients selected for inclusion in this study were serious risks The difference in the incidence of shock, severe arrhythmia, angina, and previous infarction indicates that chance selection did not occur when the type of therapy was decided upon (Comparisons were made by Chi-square analysis and Fisher probability tables) The allocation of patients was such as to prejudice the final results in favor of the bishydroxycoumarin group A greater number of the very sick patients received heparin

Table 2 cites the complications that occurred during therapy The instances are too few for valid statistical comparison The number of patients who had complications while on inadequate therapy is also shown, as we believe that more satisfactory anticoagulant control, particularly with heparin, is possible in other circumstances Hemorrhage seemed to occur more frequently in the heparin group, although not significantly so There were no hemorrhagic fatalities during the study Frequently small or moderate-sized ecchymoses formed at the site of heparin injection This problem will be discussed subsequently

TABLE 2 —Complications of Therapy

	Heparin*		Bishydroxycoumarin†	
	Total	On Inadequate Therapy	Total	On Inadequate Therapy
Arterial emboli	5	4	1	
Venous thrombi			1	
Cerebral vascular accidents	2	1	6	3
Pulmonary infarcts	1		2	1
Recurrent coronary thrombosis	2	2	3	2
Hemorrhage	7		3	

*Inadequate heparin therapy due to unnecessarily prolonged cessation of heparin for 24 hours or more or improper heparin administration So judged in 25 cases

†Inadequate bishydroxycoumarin therapy due to prothrombin concentration exceeding 30% in over half the determinations made on the patient during the hospital stay So judged in 12 cases

Adequate anticoagulant therapy decreased the heparin group mortality from 48 to 21 per cent and the bishydroxycoumarin group mortality from 67 to 31 per cent Both heparin-treated and bishydroxycoumarin-treated patients showed a significant advantage from adequate versus inadequate therapy with respect to survival (p = 0 02 for heparin therapy, p = 0 05 for bishydroxycoumarin)

TABLE 3 —Mortality Rates*

	Heparin		Bishydroxycoumarin	
	Died	Survived	Died	Survived
Total series	28	72	26	38
Adequate therapy†	16	59	18	36
Inadequate therapy†	12	13	8	4
Three or more complications on admission	14	46	11	8

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* One patient had two infarcts one year apart He was treated with bishydroxycoumarin both time He survived the first infarct but died after the second one therefore there were 163 patients but 164 attacks

† Adequate therapy was uninterrupted heparin doses given into subcentration exceeding 30% in over half the determinations made on the patient during the hospital stay So judged in 12 cases

One of the primary purposes of this project was to determine the practical problems involved in the use of the two anticoagulants in a large hospital with transiently responsible physicians and nurses With respect to orally given anticoagulants, therapeutic success depends largely upon the maintenance of prothrombin concentrations between 10 and 20 per cent In practice, in this hospital 19 per cent of the patients had prothrombin levels in excess of 30 per cent more than half the time, this occurred despite the fact that the staff was far more familiar with bishydroxycoumarin (Dicumarol) therapy than with prolonged heparin therapy Similar findings have been reported in patients in a good private hospital[5]

It is an interesting fact apparent in the literature that surgeons have been aware of the advantages of heparin over anticoagulants administered orally earlier than most internists and cardiologists[3 6 7] Thus, de Takats[8] has stated, "The treatment of choice in acute thromboembolic disease is by heparin" In 1956, Rytand[9] suggested that heparin might be preferable to anticoagulants administered orally in acute myocardial infarction Its efficacy when used for one week or longer in the prevention of impending myocardial infarction has been recorded,[2] and recently emphasized by Nichol[10] The results obtained in this study afford further support The mortality when the originally suggested dosage schedule was followed was 21 per cent for the heparin series and 31 per cent for the heparin plus bishydroxycoumarin patients While this difference does not attain statistical significance (p = 0 2), it is very suggestive in view of the significantly higher incidence of serious complications present on admission in the heparin group This discrepancy exerted a double bias since it increased the likelihood of a fatal outcome in the heparin group and decreased it in the bishydroxycoumarin one

Recent work by Mayer and Connell[11] has shown that orally given anticoagulants do prolong clotting, but that seven to ten days of therapy are usually required before the anticoagulant level is in the therapeutic range There was no significant correlation between the clotting time and the one-stage prothrombin time test These findings imply that even when orally given anticoagulants are used, heparin should be given routinely for the first seven to ten days rather than just for two to three days We do not know whether the results with heparin given for the first seven to ten days together with anticoagulants administered orally would be as good as those obtained with heparin alone for three to four weeks Since none of the anticoagulants administered orally clears lipemia, since low-animal-fat diets plus corn oil do not lower the cholesterol levels in patients with acute coronary occlusion as they usually do in normal individuals,[12] and since heparin does clear the fats in patients with acute myocardial infarction,[13] it is possible that additional benefits will accrue the longer heparin therapy is continued, because it eliminates the potentially harmful effects of serum lipemia[14 17]

These results were obtained although the staff was relatively inexperienced in the use of prolonged heparin therapy, and despite the fact that the manner of administration of heparin in the first few days of therapy in the group to whom anticoagulants were administered orally might have been more efficient Thus the bishydroxycoumarin group received 300 mg of heparin daily as opposed to 200 mg in the heparin series Furthermore in the latter group, the initial dose of heparin should have been given intravenously since the immediate onset of full anticoagulant activity, as opposed to a one-half- to one-hour delay with subcutaneous administration, may be advantageous In our private patients we have found that after an initial intravenous injection of 50 to 100 mg of heparin then 150 to 200 mg every 12 hours, subcutaneously, for the first 48 hours is usually necessary and well tolerated Ware and Stragnell[4] advocate the administration of 100 mg subcutaneously every eight

TABLE 4 — Probable Causes of Death

	No of Patients Receiving	
	Heparin	Bishydroxy coumarin
Sudden death (arrest or ventricular fibrillation)	3	4
Pneumonitis	6	2
Cerebrovascular accident	1	6
Heart failure	1	5
Arrhythmia	8	3
Shock	4	3
Arterial emboli	5	1
Pulmonary infarct		1
Recurrent infarct		1
Totals	28	26

hours and believe that with use of this technique, frequent clotting times are superfluous It is advisable, however, to measure the Lee-White time daily prior to a dose during the first 48 hours, primarily to check on the adequacy of the dose It has been our experience, as well as that of the Scandinavian investigators,[3] that clotting times prolonged to one to two hours are not dangerous and require no protamine therapy unless severe bleeding is present Frequently, after the first three to five days, a dosage of 100 to 125 mg every 12 hours suffices Once a stable level is reached, frequent clotting times are unnecessary

This study suggests that inadequate therapy and abrupt termination of anticoagulant treatment were more hazardous than the hemorrhagic complications of therapy Since seven of the ten thromboembolic complications during heparin therapy occurred in the 25 per cent that were inadequately treated, and 6 of the 13 like complications on bishydroxycoumarin took place in the 19 per cent that were poorly controlled, it is likely that the incidence of these serious complications which were often fatal, could have been reduced Thus, four of the five peripheral arterial emboli, all fatal, during heparin therapy occurred 24 to 30 hours after the abrupt and unnecessary cessation of the drug, and the fifth patient was a 200-lb man who had received 100 mg of heparin once daily When heparin administration is stopped because of minor bleeding, as from the gums, hemorrhoids, urinary tract, or injection site, clotting times should be done every 6 to 12 hours and the medication resumed when the clotting time approaches normal

It was necessary to demonstrate carefully and repeatedly the technique of heparin injection to the house staff and nurses The incidence of local ecchymoses and pain at the injection site was sharply reduced when the heparin was given very slowly into the subcutaneous fat tissue above the iliac crest and a small-bore needle (No 25 or No 26) was used Administration in the upper arm was particularly hazardous as the limited subcutaneous space permitted disruption of vessels

Summary and Conclusions

There were two groups (163) of patients with severe, complicated, acute myocardial infarction Heparin, as the sole anticoagulant, was given to 100 patients for three weeks, 63 patients were given heparin and bishydroxycoumarin (Dicumarol) for several days, and then anticoagulation was maintained with bishydroxycoumarin One was treated for a second infarct some months later Mortality in the most severely ill patients (three or more complications on admission) was significantly lower in the heparin group (23 per cent versus 58 per cent) Hemorrhage was an insignificant factor with either regimen Peripheral arterial embolic complications are a greater hazard with heparin than with bishydroxycoumarin therapy when the drug is abruptly stopped and not resumed as soon as clotting times approach normal levels Adequate heparin or bishydroxycoumarin therapy was associated with a significant increase in survival when compared with inadequate treatment In an overcrowded and understaffed hospital, heparin therapy permitted more adequate anticoagulant therapy in severe myocardial infarction than did bishydroxycoumarin

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Darwin Laboratories, Inc, Los Angeles, Lederle Laboratories Division, American Cyanamid Company, Pearl River, N Y, and the Upjohn Co, Kalamazoo, Mich, supplied the heparin used in this study

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Surgical Cure of Chronically Discharging Ear Previously Subjected to Mastoidectomy

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Reference is made to the procedures for treatment of the chronically discharging ear, treated unsuccessfully with mastoidectomy According to the medical histories of 20 patients there was a return of symptoms possibly related to upper respiratory tract infection or the passage of water into the ear The surgical procedure devised by J H T Rambo and used satisfactorily by the author consists of the introduction of a large tongue of temporalis muscle into the combined middle ear and mastoid cavity following the radical operation This, with skin flaps developed from the lining of the external canal, effects a primary closure There has been the added value of improved blood supply

THE PURPOSE of this study is to bring to the attention of the general practitioner the availability of surgical relief for the chronically discharging ear upon which one or more mastoidectomies has been performed This technique so far has been 100% successful in drying up the ear completely and restoring the patient to a normal life, indistinguishable from that enjoyed by individuals who have never had mastoiditis It will also be shown that this happy result can be obtained by any well-trained otologist willing to take the trouble of learning the technique first described by Rambo[1] for closing the radical mastoid cavity primarily Between two and five days hospitalization are required About two weeks additional loss of time from work may be anticipated, with return to full active life within three weeks of the day of operation It may now, with truth, be said that convalescence from a radical mastoidectomy or revision of a mastoid cavity previously operated upon one or more times is as predictable as the convalescence from a herniorrhaphy or uncomplicated appendectomy

The Patient with a Chronically Discharging Ear

The patient with a chronically discharging ear on which a mastoidectomy has been performed one or more times, reveals a life in which many of the more pleasurable activities have been sharply circumscribed by this annoying, disagreeable, and often dangerous complaint The history that the patient volunteers is usually one of having had a mastoidectomy performed upon an ear that has discharged for many years, either intermittently or chronically, and sometimes chronically with a bad odor The conscientious otologist who has operated upon such a patient has never been able to assure him that the ear would be cleared of its infection and remain free of discharge or how long it would take for healing to be completed But the physician often has told the patient that by having the operation, whether the discharge ceased or not, alarming complications such as brain abscess, meningitis, labyrinthitis, septicemia, lateral sinal thrombosis, and facial paralysis would be avoided

In my personal experience, using Lempert's instruments and performing his type of mastoidectomy[2] in chronically discharging ears, I have been able, after from one to four operations and hospitalization ranging from 90 to 457 days[3] to clear up the discharge in 69% of 122 consecutive cases and have the patient mightily pleased at having had this result Nevertheless, even after such patients are cured of their infection, the constant threat of breakdown for no reason at all, apparently following a common cold or the accidental introduction of water into the ear bringing on another breakdown in the cavity with the reappearance of the aural discharge, is a source of constant anxiety

Patients with this history have, in many instances, ceased visiting the otologist Operating upon a mastoid cavity that has already undergone surgical exploration is notoriously difficult Because of the poor results obtained under the best of circumstances, otologists have tended to avoid revisions of previously performed mastoidectomies and the patients then returned to the general practitioner whom they have found is as capable in the nonoperative care of a chronically discharging ear as the otologist, and often considerably less expensive

Data on Patients on Whom Rambo Revision was Performed

Case	Age, Yr, at Time of Closure	Sex	Race	Date, Type of Previous Operation on Ear Being Reported	Date of Rambo Revision With Muscle Implant and 1° Closure	Date When Healed, Dry, and Well	Complications of Operation	Other Ailments Afflicting Patient	Pathology	Hospital Days
1	14	M	Esk*	Sept 13 1957, rt radical April 17, 1958, rt revision with split thickness graft May 23, 1958 rt revision	Sept 10 1958	Sept 29, 1958		T&A biopsy of *thyroid Sept 13,* 1958 corneal scars	Chronic mastoiditis Cholesteatoma	10†
2	13	M	Esk	May 28, 1958 l radical	Nov 3 1958	Nov 10 1958		Recurrent otitis media rt rt drum 75% missing dry Corneal scars	Chronic mastoiditis	4†
3	22	M	Esk	Dec 19, 1950 l radical March 1, 1954, l revision with split thickness graft	Dec 15 1958	Dec 29, 1958		Rt drum thick distorted, retracted central choreoretinitis, rt and l caries of teeth chronic supp pansinusitis rt and l corneal scars	Missing	4†
4	17	F	White‡	1954—2nd of 2 rt mastoid operations	Dec 19 1958	Jan 21 1959			Chronic mastoiditis	3
5	37	F	White	March 14 1955 rt radical July 17, 1957 rt revision April 11 1958 rt revision with split thickness graft	Jan 7, 1959	Jan 21 1959	Bruised 7th nerve with complete paralysis well *June 16, 1959*	Thoracoplasty for tbc 1941	Cholesteatoma	4
6	41	M	White	March 22 1955 rt radical with split thickness graft March 14, 1957 rt revision and tonsillectomy Sept 12 1957 rt revision	Jan 27 1959	Feb 10 1959	4 cc clear serum beneath skin flaps Feb 6 7 and 8, 1959		Chronic mastoiditis (aural polyp)	3
7	14	M	Ind	"Some years" be*fore* 1956—rt radical	March 26, 1959	April 13 1959		Rt knee fused for tbc of joint corneal scars l drum large central perf	Chronic mastoiditis	16†
8	34	F	White	Nov 2 1953 l radical	May 22 1959	June 16 1959			Cholesteatoma	4
9		F	Esk	Feb 9 1954 I&d l mastoid abscess March 23 1954 l radical with split thickness graft Aug 30 1954 closure mastoid fistula l r revision with split thickness graft March 11 1955 same March 25 1955, 7th and 12th nerve anastomosis	June 15 1959	July 6 1959	Cut 7th nerve op of March 11, 1955	March 24 1954 T&A	Missing	14†
10	17	M	Aleut	Sept 26 1955 rt radical with split thickness graft July 10 1957 rt revision with graft from behind ear	June 18 1959	July 2, 1959		Chronic nonsupp otitis media l scarred corneas	Cholesteatoma	6
11	14	F	Aleut	Sept 20 1955 l radical	June 24 1959	July 8 1959		Scarred corneas	Cholesteatoma	3
12	9	M	Esk	Rt radical 1958 behind ear split thickness graft	Aug 3 1959	Aug 17 1959		Spinal fusion for tbc	Cholesteatoma	14†
13	9	M	Esk	L radical 1958 behind ear split thickness graft	Aug 24 1959	Sept 14 1959		Spinal fusion for tbc	Cholesteatoma	21†
14		F	White	L radical 1954	Sept 10 1959	Sept 21 1959	Lac of dura with burr small leak stopped with muscle covering it	Dense corneal scar l eye dry centrally perf rt eardrum	Cholesteatoma	7†
15	16	F	Esk	L radical some time prior to 1958	Sept 28 1959	Oct 19 1959		Corneal scar	Missing	25†
16	15	F	Esk	Rt radical behind ear prior to 1959	Oct 19, 1959	Oct 26, 1959		Corneal scars	Missing	15†
17	28	F	White	L radical 1944 behind ear, l revision 1953 endaural	Oct 28, 1959	Nov 11 1959			Chronic mastoiditis	[illegible]

Data on Patients on Whom Rambo Revision was Performed

Case	Age Yr at Time of Closure	Sex	Race	Date Type of Previous Operation on Ear Being Reported	Date of Rambo Revision With Muscle Implant and 1° Closure	Date When Healed Dry and Well	Complications of Operation	Other Ailments Afflicting Patient	Pathology	Hospital Days
18	29	M	White	L radical 1947	Nov 12 1959	Jan 22 1960	Hematoma 5 cc beneath temporal skin patient left state before healing completed developed abscess in middle ear March 4 9 1960 now well	Chronic mastoiditis rt cholesteatoma rt dev nasal septum	Chronic mastoiditis	8
19	61	F	Esk	Oct 31 1955 l radical	Nov 23 1959	Dec 15 1959		Tonsillectomy Nov 18 1959	Chronic mastoiditis	22†
20	43	M	White	1945 rt radical behind ear	Feb 12 1960	Feb 19 1960			Chronic mastoiditis	8
21	19	M	Esk	Rt and l radical—year?	April 26 1960	May 18 1960		Mastoid fistula behind right ear tonsillectomy and adenoidectomy year?	Chronic mastoiditis	14
22	19	M	Esk	Rt and l radical—year?	May 18 1960	June 4 1960			Chronic mastoiditis	14

* Esk—Eskimo
† Date of discharge dependent on transportation to home and availability of funds for same—not on clinical condition
‡ Ind—Indian

this is not a fanciful interpretation is well attested to by the 14 patients who have arrived in our local hospitals in the past 12 years moribund or dead-on-arrival because of these and other dread complications of chronic mastoiditis

This study is brought to the attention of the general practitioner, who can, if he will, send his cases of unilateral mastoiditis, with or without a history of previous surgery, to those well-trained otologists in this country and elsewhere who can, with relative ease, learn the additional steps discovered and developed by Rambo for the elimination of just one more of the diseases that plague mankind

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WILLIAM HEBERDEN —William Heberden, was a great gentleman and a scholar who was proficient in Latin, Greek and Hebrew, but above all he was a great clinician Heberden was, I believe, the first person to separate clearly smallpox from chickenpox, he was also the first to describe night blindness, but probably his most important contribution was to give a complete clinical picture of angina pectoris which was done in 1768 The underlying pathology of this disease, of which John Hunter was a sufferer, was not understood by Heberden, but was elucidated a little later by Heberden s friend, Edward Jenner, who was the first to describe the characteristic changes in the coronary vessels The discovery of the subcutaneous nodules which are found in a large proportion of cases of rheumatic disease and which are named after Heberden, is probably one of his relatively minor contributions But William Heberden was not only a very good clinical observer, he was interested in natural science in general He published several papers in the Philosophical Transactions on medical and meteorological subjects and his critical writings and lectures on materia medica had probably considerable influence on the reform of the Pharmacopoeia in 1788, which finally purged the latter of superstitious polypharmacy —A Neuberger, F R S Heberden Oration The *Proteins of Connective Tissue and Their Metabolism, Annals of the Rheumatic Diseases,* March, 1960

Poliomyelitis Component in Quadruple Antigen

Controlled Clinical Study of Enhanced Response of Children

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The immunologic effects of quadruple diphtheria, tetanus, pertussis, poliomyelitis aluminum phosphate adsorbed vaccine were compared with triple diphtheria, tetanus, and pertussis aluminum phosphate adsorbed vaccine alone and poliomyelitis vaccine alone A total of 192 children who had not been previously immunized with the respective antigens were studied The poliomyelitis antibody responses were significantly greater with quadruple vaccine than with poliomyelitis vaccine alone The diphtheria antibody responses were greater with quadruple vaccine than with triple vaccine The antibody responses for tetanus and pertussis were essentially the same for both vaccines

THE ADVANTAGES and efficacy of combined diphtheria, tetanus, and pertussis (DTP) antigens in routine pediatric immunization programs have been well described,[1] as has the effectiveness of formalin-inactivated poliomyelitis vaccine[2]

The antibody responses of infants[3] and monkeys[4] to poliomyelitis vaccine mixed with DTP vaccine prior to injection or to the two preparations simultaneously injected at separate sites also have been reported[3] In addition, the antibody responses of children to a multiple DTP-poliomyelitis vaccine have been shown[5]

Recently, Schuchardt and associates[6] reported responses in animals to a combined alum-precipitated DTP-poliomyelitis vaccine They concluded that the combined vaccine resulted in an enhanced poliomyelitis antibody response in monkeys as compared to the response with poliomyelitis vaccine alone, and that guinea pigs responded equally well to the diphtheria, tetanus, and pertussis components

The present report concerns a clinical study of the responses in children to all antigens contained in a combined DTP-poliomyelitis aluminum phosphate-adsorbed vaccine (Compligen) compared with the responses obtained with poliomyelitis vaccine alone and DTP vaccine alone

Materials and Methods

Poliomyelitis Vaccine—Three lots of commercial poliomyelitis vaccine that had satisfactorily met all requirements for safety and potency were used

Diphtheria and Tetanus Toxoids and Pertussis Vaccine—Two lots of aluminum phosphate-adsorbed DTP vaccine were used These lots, specially prepared for this study, had passed all tests for safety, freedom from toxicity, and potency

Combined Vaccine—The three lots of poliomyelitis vaccine referred to above were used in the preparation of the four lots of combined vaccine used in this study Also, each dose of combined vaccine contained the antigen derived from a single dose of the poliomyelitis vaccine The diphtheria, tetanus, and pertussis components of the combined vaccine and the two lots of DTP vaccine were prepared in an identical manner In each dose, the individual toxoid concentrations, in terms of limit of flocculation (Lf) units, and the amounts of pertussis vaccine, measured in opacity units, were the same

Determination of Antibody Levels—Poliomyelitis neutralizing antibody levels for each of virus Types I, II, and III were determined by mixing twofold dilutions of heat-inactivated serum with equal volumes of poliovirus containing approximately 100 $TCID_{50}$ per 0 1 ml These mixtures were incubated for one hour at 22° to 25° C (71 6° to 77° F), and 0 2-ml amounts of each mixture were transferred into duplicate tubes containing monkey-kidney-tissue monolayers

Diphtheria circulating-antibody levels were de-

From Pitman-Moore Company, Division of Allied Laboratories

TABLE 1 —Poliomyelitis Antibody Response in Children After Three Injections of Quadruple Vaccine

Age Group	No of Subjects	No Negative to Type			% Conversion from <1 4 to 1 4 or> and (Geometric Mean Titer)			Number of Triple Negatives	% Conversion from <1 4 to 1 4 or> and (Geometric Mean Titer)		
		I	II	III	Type I	Type II	Type III		Type I	Type II	Type III
<6 mo	20	12	5	11	83 3 (GM=35 6)	80 0 (GM=9 1)	72 7 (GM=35 8)	2	Insufficient number for analysis		
6 mo to 2 yr	38	30	32	32	86 6 (GM=51 3)	96 9 (GM=1[illegible]9)	93 8 (GM=73 5)	26	92 2 (GM=66 7)	96 2 (GM=193 2)	92 2 (GM=44 7)
2 yr to 6 yr	37	29	32	27	89 7 (GM=38 1)	96 9 (GM=125 9)	96 3 (GM=49 9)	21	85 7 (GM=34 8)	95 2 (GM=125 9)	95 2 (GM=44 1)
Totals	**95**	**71**	**69**	**70**	**87 3** (GM=42 9)	**95 7** (GM=116 2)	**91 4** (GM=57 2)	**49**	**87 8** (GM=52 8)	**93 3** (GM=159 6)	**91 8** (GM=46 6)

termined by making suitable dilutions of serum, and combining them with a standard (Lr/$_{1\,000}$) dose of toxin Rabbits were injected intradermally with 0 2 ml of each mixture containing Lr/$_{1\,000}$ of toxin After 72 hours, the dermal reaction was compared with that in the same rabbit by 0 001 unit of standard antitoxin combined with the same dose of toxin Tetanus circulating-antibody levels were determined by making suitable dilutions of serum and combining them with an L+/$_{1\,000}$ dose of toxin Mice were injected subcutaneously with 0 5 ml containing an L+/$_{1\,000}$ of toxin The time of death was compared with that of mice injected with 0 001 unit of standard antitoxin combined with the same dose of toxin

Pertussis agglutinins were determined by mixing equal 0 1-ml quantities of pertussis antigen containing 20 billion organisms per milliliter, determined photometrically, and twofold dilutions of the serum to be tested After addition of 0 5 ml of physiologic saline, the mixtures were shaken for three minutes After incubation at 37° C (98 6° F) for one hour the tubes were observed macroscopically and the endpoint taken as the highest dilution of serum in which definite agglutination was observed

Patients—A total of 192 children varying in age from 1 month to 6 years had negative immunization history with the respective antigens

Immunization Schedule—All children were given a course of vaccinations consisting of three injections of 1 ml each at approximately one-month intervals This schedule was adopted because it is a recommended primary immunization schedule for DTP vaccines For comparative purposes, the poliomyelitis-containing vaccine was administered according to the same schedule and therefore must be considered as a primary or sensitizing vaccination rather than a completed immunization It is generally acknowledged that poliomyelitis immunization should not be considered completed until the first series of injections is followed by a reinforcing dose at an interval of not less than six months[7,8,9]

Blood specimens were obtained from each child immediately prior to the first vaccine injection and again one month after the third injection The speci-

TABLE 2 —Poliomyelitis Antibody Response in Children After Three Injections of Poliomyelitis Vaccine

Age Group	No of Subjects	No Negative to Type			% Conversion from <1 4 to 1 4 or> and (Geometric Mean Titer)			Number of Triple Negatives	% Conversion from <1 4 to 1 4 or> and (Geometric Mean Titer)		
		I	II	III	Type I	Type II	Type III		Type I	Type II	Type III
<6 mo	8	1	1	0	*Insufficient number for analysis*			0	Insufficient number for analysis		
6 mo to 2 yr	16	13	15	14	46 2 (GM=15 9)	86 7 (GM=20 3)	78 6 (GM=23 5)	11	45 5 (GM=2.9)	81 8 (GM=39 7)	81 8 (GM=12 3)
2 yr to 6 yr	18	14	14	12	42 9 (GM=5 6)	92 9 (GM=34 8)	91 7 (GM=23 7)	10	40 0 (GM=3 7)	100 0 (GM=48 9)	90 0 (GM=18 2)
Totals	**42**	**28**	**30**	**26**	**46 4** (GM=4 5)	**78 9** (GM=38 9)	**73 3** (GM=15 0)	**21**	**42 9** (GM=3 0)	**90 5** (GM=24 3)	**85 7** (GM=14 8)

TABLE 3 —Diphtheria, Tetanus, and Pertussis Antibody Responses in Children After Primary Immunization with Quadruple Vaccine

		Diphtheria		Tetanus		Pertussis	
Age Group	No of Subjects	No with <0 01 U/ml Pre-Vaccination	% Conversion from <0 01 to >0 01 U/ml	No with <0 01 U/ml Pre-Vaccination	% Conversion from <0 01 to >0 1 U/ml	No with Agglutination Titer of <1 4 Pre-Vaccination	% Conversion from <1 4 to 1 32 or > per 0 1 ml
<6 mo	20	17	82 4	18	94 4	19	73 7
6 mo to 2 yr	38	36	100 0	33	97 3	35	94 3
2 yr to 6 yr	37	32	93 8	27	100 0	32	93 8
Totals	**95**	**85**	**94 1**	**78**	**97 4**	**86**	**89 5**

TABLE 4 —Diphtheria, Tetanus, and Pertussis Antibody Responses in Children After Primary Immunization with DTP Aluminum Phosphate—Absorbed Triple Antigen

Age Group	No of Subjects	Diphtheria		Tetanus		Pertussis	
		No with <0 01 U/ml Pre-Vaccination	% Conversion from <0 01 to >0 01 U/ml	No with <0 01 U/ml Pre-Vaccination	% Conversion from <0 01 to >0 1 U/ml	No with Agglutination Titer of <1 4 Pre-Vaccination	% Conversion from <1 4 to 1 32 or > per 0 1 ml
<6 mo	17	15	86 7	17	100 0	17	88 2
6 mo to 2 yr	13	13	69 2	11	90 9	12	91 7
2 yr to 6 yr	22	22	81 8	18	77 7	22	100 0
Totals	52	50	80 0	46	89 1	51	94 1

mens were tested for antibody against all antigens of the vaccines

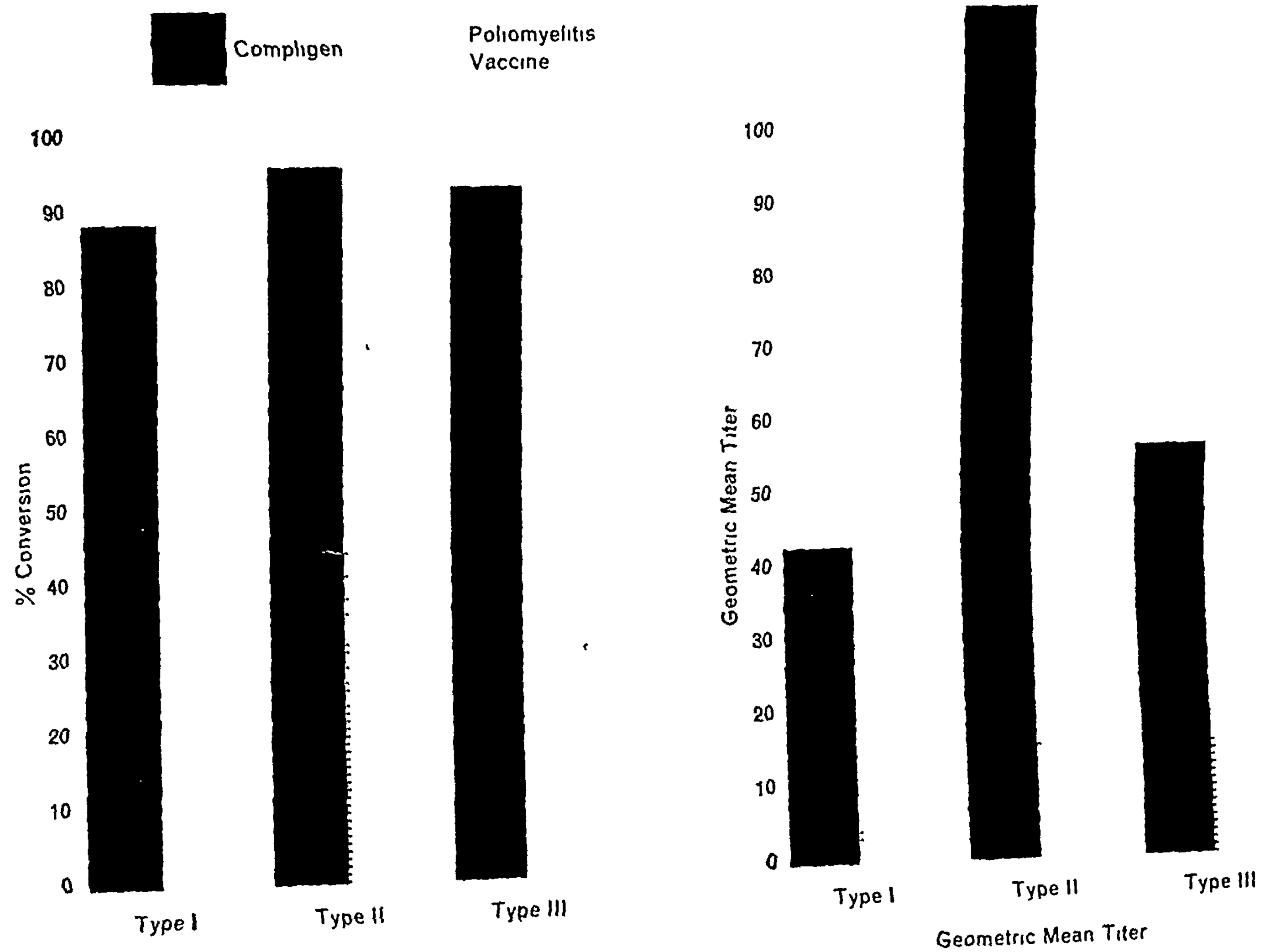
Results and Comment

The *responses to the various antigens in children* of three age groups as well as the combined totals *of all three age groups are summarized in* Tables 1 to 4

A comparison of Tables 1 and 2 shows that the percentage conversion from a titer of less than 1 4 to 1 4 or greater was higher in the group receiving combined vaccine than in the group that received poliomyelitis vaccine alone The greater response to combined vaccine as opposed to poliomyelitis vaccine alone applies both to children negative to type only and to those initially triply negative The difference is significant with Type I antigen

The geometric mean antibody titers to all three types of poliovirus *were significantly* higher in the group vaccinated with combined vaccine (Tables 1 and 2) The poliomyelitis antibody *responses* to combined and to poliomyelitis vaccine are shown in Figure 1

The poliomyelitis antibody studies (Tables 1 and 2) further reveal that many of the children under 6 months of age at the time of the first injection had preexisting antibody titers against one or more types of poliovirus This fact reduced the number



% Conversion from < 1 4 to 1 4 or >

Geometric Mean Titer

Fig 1 —Comparison of poliomyelitis antibody levels after primary immunization with quadruple vaccine or poliomyelitis vaccine in children originally negative to type

of triply negative children in the less-than-6-month age group to insignificant levels, however, the percentage conversion (from less than 1 4 to 1 4 or greater) effected by combined vaccine in these young children negative to any one type indicates a high conversion rate Although the numbers are relatively few, it may be noteworthy that the geometric mean antibody titer against Type II was lower than that for the older age groups, possibly due to suppression of antibody responses by heterotypic passive antibody The high percentage of poliomyelitis pre-titers in the less-than-6-month group was probably mainly due to passively transferred maternal antibody Presence of maternal antibody in younger infants has been well documented,[7] [8] and was further supported in this study by the relatively high proportion of children in the 6-month to 6-year age groups with no demonstrable pre-titers

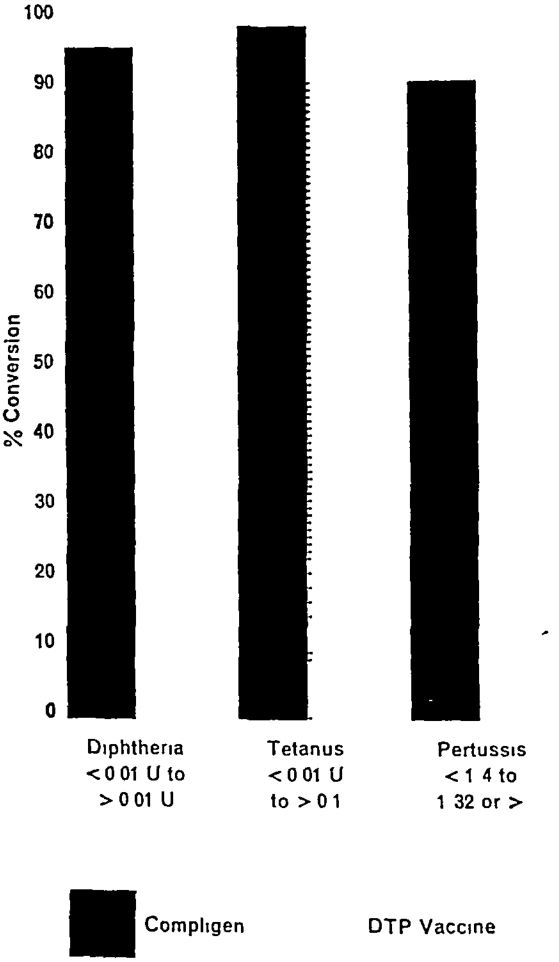


Fig 2 —Comparison of diphtheria, tetanus, and pertussis antibody responses after primary immunization with quadruple vaccine or DTP triple antigen

A high rate of primary response to diphtheria, tetanus, and pertussis antigens was obtained with both combined and DTP vaccine (Tables 3 and 4) These data show that the response to the diphtheria antigen was significantly greater when combined vaccine was used than with DTP vaccine

The diphtheria, tetanus, and pertussis antibody responses to combined and to DTP vaccine are shown graphically in Figure 2

Summary

Antibody responses in children to primary vaccination (three doses at one-month intervals) with a combined poliomyelitis-diphtheria-tetanus-pertussis vaccine (Compligen) were studied and compared with responses to primary vaccination with poliomyelitis vaccine and DTP vaccine given separately

The poliomyelitis antibody responses were significantly greater with combined vaccine than with poliomyelitis vaccine alone, both in terms of percentage conversion from negative to positive for Type I and in terms of geometric mean post-immunization antibody level for all three types

The diphtheria antibody response to combined vaccine was significantly higher than that to DTP vaccine, while the tetanus and pertussis responses were essentially the same in either case

Drs A H Brueckner and Karl Mayer advised and helped in the preparation of the manuscript

Drs Morten Andelman and Dorothy Welker, Chicago, L M DeDario, Elkhart, Ind and James Hill, Indianapolis cooperated clinically

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Lethal Cutaneous and Gastrointestinal Arteriolar Thrombosis

(Malignant Atrophying Papulosis of Degos)

Edwin Sidi, M D , Alain Reinberg, M D , Ph D , Jacqueline B Spinasse, M D , and Marc Hincky, M D , Paris, France (Translated by Cyril March, M D , New York)

The authors report in detail two cases of the rare disease entity "malignant atrophying papulosis" No previous descriptions of this lethal cutaneointestinal syndrome have been found in the American literature The patients were two men 24 and 30 years of age The cutaneous lesions consist of pink papules which progress to a characteristic necrotic lesion with porcelain-white center and are diagnostic The eruption is sooner or later associated with ill-defined gastrointestinal complaints which almost always eventuate into the clinical picture of peritonitis The outcome is fatal, with death due to multiple intestinal perforations The etiology is unknown and no satisfactory treatment is available

A NUMBER of diseases are known in which there are associated apparently benign cutaneous manifestations and serious visceral changes Among these are acanthosis nigricans with intestinal cancer, acrodermatitis enteropathica, Libman-Sachs disease, Peutz-Jeghers syndrome, and others Lethal cutaneous and gastrointestinal arteriolar thrombosis is another intestinal disease associated with characteristic cutaneous signs This disease seems rare, as only nine cases have been published to date, all in Europe

Almost simultaneously, Degos and colleagues[4] in France and Kohlmeier[8] in Austria published two similar cases The third case by Lausecker[9] and a fourth one by Tzanck, Civatte, and Sidi[13] allowed Degos[5 6 7] to separate this disease as an entity of its own Since then Stauffer,[11] Stauffer and Miescher,[12] Basset and associates,[1 2] and Cottini and co-workers[3] have published other cases Two cases[10 13] have been studied by us and form the subject of this report Since the first case has been reported previously,[13] only a short summary will be given here

Report of Cases

CASE 1 —A 24-year-old man consulted us in April, 1947, about an eruption of a few months' duration He was apparently in good health, except for some vague gastrointestinal symptoms for which he had consulted a gastroenterologist Clinical examination and radiologic studies of his gastrointestinal tract were negative The cutaneous lesions consisted of papules 3 to 10 mm in diameter which were slightly raised at the periphery and had a porcelain-like center with a scale This scale could be easily removed and was surrounded by a thin violaceous ring He presented about 40 such papules on the forearms, back, and penis These had appeared in successive eruptions Several atrophic macules were arranged in a clover leaf-like pattern Histologic examination of the skin lesions disclosed the characteristic features of epidermal atrophy with arteriolar obliteration

The patient was hospitalized Routine hematologic and blood chemistry examinations were negative Gastroscopy revealed a few small muscosal erosions Fifteen days after hospitalization, while under penicillin therapy, signs of acute abdominal distress consisting of vomiting and intestinal hemorrhage occurred during the night The surgeon on duty performed an emergency laparotomy, removed the appendix, and observed intestinal lesions which were non-perforated but which appeared to be similar to the cutaneous lesions The patient died a few days later with a peritoneal syndrome

CASE 2 —A 30-year-old man was first seen by us on Dec 31, 1959, because of a polymorphous eruption consisting of papular and atrophic elements which had begun 10 months previously He had a history of mastoidectomy at 5, urticaria at 8, 10, and 25 years, pulmonary tuberculosis at 20, jaundice

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From the Service of Dermatology and Allergy of the Fondation Ophthalmologique Alphonse de Rothschild at 21, bladder pains at 24, onset of abdominal and epigastric pains at 26 and onset of cutaneous lesions at 29 years of age The family history was not noteworthy except that his mother, although in good health, had suffered from myalgia and ill-defined gastrointestinal symptoms similar to those of the patient A sister had had asthma and urticaria and the paternal grandmother had asthma

The patient appeared in relatively good general condition, but appeared somewhat pale He stated that he felt tired in the morning, especially when the intestinal symptoms were more marked There had been a weight loss of about 5 lb (2 3 kg) over the last month

The first papular elements had appeared on the penis during February, 1959 Two more papules appeared somewhat later without any other symptoms In the summer of 1959, a new outbreak of a fairly large number of small papular elements made its appearance, first on the posterior thighs, then on the arms and on the anterior chest In September, 1959, atrophic elements were seen for the first time, they developed through the sudden transformation of older papular lesions which became atrophic macules covered with a light scale and surrounded by a pinkish, edematous, collarette

The initial lesion seemed to be a lentil-sized, slightly edematous papule, of pink or skin color The papule itself was not pruritic but its appearance was at times preceded by slight burning These papules followed a variable course Some persisted without change for months, others disappeared entirely, leaving a small, achromic spot without atrophy and of the same size as the initial papule, but most progressed to the atrophic stage This transformation was rapid From one day to the next one could find round or oval painless lesions, at times somewhat irregular in outline, from 2 to 15 mm in diameter These were characterized by a central atrophic white, depressed, porcelain-like zone, covered by a more or less adherent scale and a peripheral thin, pink, edematous rim which decreased in thickness as the atrophic plaque extended in size Neither the coalescence of several elements which had been noticed in our first case, nor the varicelliform or finely creased scars which had been seen by other authors were observed The extension of the atrophic lesions took place suddenly at widely spaced intervals just as did the appearance of new elements which occurred in localized areas and with a slight sensation of irritation

There was a distinct predominance of the papular elements on the anterior aspects of the trunk and of the larger atrophic elements on the posterior aspects of the thighs Lesions of all kinds occurred in large numbers on the distal part of the extremities, especially on the anterior wrists In accordance with the findings of Basset and colleagues[1, 2] it was noted that the lesions tended to be distributed more proximally than distally and more on the flexors than on the extensors A few isolated papules were observed on the back and some polymorphous elements in the cervical region and on the dorsa of the hands The face, palms, soles, buccal muscosa, conjunctivae, and corneas were not involved and no adenopathy was noted

Neurological and musculoskeletal examination revealed no abnormalities, although there was a history of myalgia for the past 5 to 6 years This was limited to both arms, mostly on the right side, and was of variable intensity, sometimes quite severe and occurring spontaneously during rest, with improvement during light exercise

In 1956 he had had epigastric pains with increasing frequency, these lasted up to one hour and had no relation to food intake or other known factors In 1958 these pains became diffuse and of variable intensity and duration and simulated the pains of chronic amebiasis These symptoms did not respond to belladonna or bismuth Radiography of the colon and a search for ameba were negative Since September, 1959, he has had bilateral inguinal recurrent pains Physical examination was negative except for some diffuse abdominal tenderness

General physical examination otherwise did not reveal any abnormal findings except for the funduscopic examination, which showed a small plaque of atrophic pigmentary choroiditis on the right lateral fundus

The following examinations of the blood were found to be normal or negative serologic test for syphilis, glucose, white blood cell and differential count, sedimentation rate, total lipids, beta lipoproteins, total cholesterol, bleeding and coagulation time, and serum electrolytes However, the excretion of 17-ketosteroids in the urine was low on Jan 9, 1960 (4 6 mg per 24 hours) and normal on Feb 6, 1960 (11 5 mg per 24 hours) On Feb 6, 1960, the excretion of 17-hydroxycorticoids was 9 2 mg per 24 hours, the dehydroepiandrosterone 1 1 mg per 24 hours and the folliculin 15 mg per 24 hours

Stool examination showed rare eggs of *Trichocephalus* and nonpathogenic *Entamoeba coli* but no blood

The following investigations gave results which may be considered slightly abnormal red blood cell count 5,040,000 per cubic millimeter, hematocrit 52 8% (normal 46% ± 3, Blood viscosity 5 2 (normal 4 7 ± 2), serum protein level 7 Gm per 100 cc, with reduction of albumin fraction (57%) and the increase in globulin fractions primarily due to gamma globulins (16%), prothrombin 75% of normal, and test of resistance to heparin showed slight hypocoagulability as compared to control Blood serum and urine showed very slight proteolytic activity, the plasma showed no antitryptic activity

Microbiological studies on material from the skin lesions and on blood did not show any abnormality

The histological findings in the cutaneous lesions were characteristic and similar to those in previously described cases

Comment

It is quite possible that the rarity of this disease is only due to the apparent benignity of the cutaneous lesions which do not attract the attention of the physician Or perhaps in some cases the intestinal part of the syndrome makes its appearance without development of any cutaneous lesions and thus the disease may not be identified

A review of the observations published by others and of our two cases allows us to delineate a number of the characteristics of this illness The nine published cases concern eight men and one woman, seven of these were young adults (the youngest was 16 years old) and the other two were men 49 and 59 years of age No etiological agent has been discovered in the reported cases The general condition of the patients tends to be good There is no fever, but asthenia and loss of weight are noted at times The gastrointestinal disturbances are varied and may suggest epigastric cramps, gastritis, ulcer, enteritis, or dysentery and may precede the onset of the cutaneous lesions Radiological examination suggests functional disturbances Search for intestinal parasites, stool cultures, rectoscopy, gastroscopy, and other tests usually are negative

The skin eruption occurs all of a sudden while the patient is in good health It is absolutely characteristic and suggests the probability of a lethal outcome The number of lesions is variable, usually about 30, but may be less or may reach 100 The papular elements may persist unchanged for months or may disappear The atrophic lesion is characteristic for the disease Urticarial-type, ulceropustular, and gumma-like nodular lesions have been reported

The disease has been fatal in seven of the nine cases reported The patient reported by Stauffer[11] is alive and has never presented gastrointestinal symptoms Our second case reported above is in apparent good health aside from those symptoms affecting the gastrointestinal tract The laboratory examinations are essentially normal except for the low prothrombin values in our second case, which were observed also in the case reported by Basset[1] [2] In three cases, gastrointestinal symptoms have preceded the abdominal crisis The latter suggests a classical picture of peritonitis by perforation with extreme pain, spasms, vomiting, and fever In three cases, hematemesis or enterorrhagia showed the vascular involvement in the lesions Surgical intervention confirms the peritonitis, but the perforation which is generally very small may escape the eye of the surgeon who is confronted with a great number of subserous necrotic plaques in the intestine and must content himself with drainage The course after the abdominal crisis is rapid and lethal However, in Kohlmeier's case, the perforation was located and a resection was performed The patient lived for one month until a second acute abdominal episode occurred Cottini's case survived through a severe abdominal crisis In those cases where the onset of the disease is abdominal, a laparotomy allows one to make a diagnosis on the basis of the intestinal lesions

In the papular stage the epidermis is almost normal with occasional hyperkeratotic or parakeratotic areas, slight acanthosis and lengthening of the rete pegs The upper dermis displays considerable edema which greatly changes the normal architecture In addition, there is a marked capillaritis with a banal perivascular infiltrate and with turgescent capillary endothelium In the mid-dermis the collagen has lost its normal structure, seems to be more condensed, and numerous histocytes and fibroblasts are seen The skin appendages are surrounded by an inflammatory mononuclear infiltrate of varying intensity In the deep dermis the major changes are at the level of the blood vessels The veins show a turgescent endothelium and a nonspecific perivascular infiltrate The arterioles show an obliterating arteriolitis with the following characteristics The adventitia is surrounded by mononuclear cells, the media elastica is normal, the intima shows fibrinoid necrosis and turgescence and perforation of the vascular endothelium Early thromboses are seen The process is essentially an obliterating arteriolitis

In the atrophic state the epidermis at the center of the lesion is atrophic with only two or three cell layers present, these are covered with a hyperkeratotic eosinophilic keratin layer On either side of the atrophic lesion, the epidermis is fairly normal with a few areas of hyperkeratosis and parakeratosis In the upper dermis only a few rare cells with many pyknotic nuclei are seen At the periphery of the lesion there is edema with varying amounts of perivascular infiltrate Some of the capillaries are dilated with swelling of the endothelial cells In the mid- and deep dermis there is disappearance of all the adnexae A histiolymphocytic infiltrate advances into the panniculus in certain areas, and vascular lesions are seen The veins are rarely involved but most of the arterioles are the seat of an obliterating arteriolitis, the adventitia being infiltrated with mononuclear cells The media and elastica are intact but there is involvement of the intima with fibrinoid degeneration and endothelial proliferation Finally, thromboses complete the obliteration

Thus, the histological picture explains the clinical lesions At first, there is a papule with subjacent edema and inflammatory nonspecific reaction followed by an atrophic lesion with an atrophic epidermis covered by a hyperkeratotic layer over a dense atrophic dermis with compact collagen This explains the porcelain-like appearance of the lesions of the second stage The foci of circumscribed necrosis are surrounded by a banal inflammatory reaction of the neighboring tissues which are slowly replaced by fibrosis The vascular lesions are at the basis of all the cutaneous lesions seen

The abdominal lesions correspond to the skin lesions (white infarct) and are the end result of a submucosal arteriolitis

Malignant atrophying papulosis (M A P) is clearly distinct from periarteritis nodosa The lesions of M A P are limited to the vascular system of the skin and of the gastrointestinal tract In addition, the arteriolar lesion is limited to the intima while the lesion of periarteritis nodosa is not

Kohlmeier [8] and Lausecker [9] thought that M A P was a variant of thromboangitis obliterans (Buerger's disease) However, the clinical characteristics of the two diseases are quite different in M A P there are no hematological disturbances, no painful necroses in the extremities, and no particular racial distribution Cutaneous eruptions similar to M A P have never been observed in well authenticated cases of Buerger's disease The intestinal lesions particularly are multiple white infarcts limited to subserous arterioles in M A P , while in Buerger's disease, the intestinal lesions present as red infarcts, somewhat massive, with lesions of the trunk of the superior mesenteric artery

All therapeutic trials, among others with arsenic, antibiotics, vaccines, and corticoids have been unsuccessful until now and have not prevented a fatal outcome One wonders if the use of corticoids might not aggravate this disease It seems that up to a certain point the use of anticoagulants, especially heparin could lead to a slowing down of progression of the illness This was the case in Basset's patient and also in our second patient However, the anticoagulants do not seem to influence the pathological process of obliteration but rather act on the thrombosis which follows in its wake As far as measures are concerned which one should take when confronted with the acute abdominal episode, Basset feels that surgical intervention is useless However, in Kohlmeier's case the patient had a single perforation and the operation was successful The possibility thus exists of at least prolonging life with surgical intervention

Summary

Two cases of malignant atrophying papulosis, a fatal cutaneous and gastrointestinal disease, are presented and compared with the other nine cases of this disease which have been reported The cutaneous part of the disease starts with pink papules which progress to a characteristic porcelain-like necrotic lesion The eruption is associated with ill-defined complaints referring to the gastrointestinal tract The evolution of the disease is almost always fatal, eventuating into the clinical picture of peritonitis due to multiple intestinal perforations In the gastrointestinal tract, lesions due to arteriolar thrombosis similar to those in the skin are found The etiology of this disease is unknown and no satisfactory treatment for it has been suggested

Addendum

While this paper was in the process of translation, the first two American cases of papulosis atrophicans maligna (Degos') were reported [14, 15] The similarity between these two cases and those reported by Sidi is quite remarkable However, some differences of opinion remain concerning the nosology of this entity

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The histologic studies reported in this communication were carried out by Dr G Melki

Microbiological studies on material from skin lesions and on blood were carried out by Professors Lepine and Prevost, Institut Pasteur, Paris

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JAMA, Oct 29, 1960

Osteogenic Sarcoma in Children

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One hundred twenty-nine children (67 girls and 62 boys) less than 16 years of age with pathologically verified osteogenic sarcoma have been seen during the 50-year period, 1909 through 1958 Adequate follow-up information is available on 126 of the patients The survival rates among children with osteogenic sarcoma are influenced by the degree of malignancy and location of the tumor and the type of therapy administered Amputation was the primary form of therapy in 101 patients, radiation, was the treatment given 15 patients, excision of the tumor was carried out in only 6 Seven patients were not treated The authors believe that early amputation is the treatment of choice in patients whose tumors arise in the extremities and who do not manifest evidence of metastasis No patient with a tumor arising at a site that precluded amputation survived five years, and only one patient treated with radiation therapy survived

OSTEOGENIC sarcoma is the most common primary malignant neoplasm of bone in man, excluding myeloma It may occur at any age or in either sex, but the peak incidence is observed during the second and third decades of life, males are affected more frequently than females Characteristically the tumors manifest themselves as rapidly progressive painful swellings about the ends of the long bones, but they may arise in any bone Redness, point tenderness, increased local heat, limitation of motion of the joint adjacent to the tumor, and, in some instances, accompanying systemic reaction may lead to erroneous diagnosis of infection rather than neoplastic disease In most instances the clinical course and roentgenographic changes in the bone at the site of the tumor lead the physician to suspect osteogenic sarcoma, but the diagnosis is established only by pathologic study of an adequate biopsy specimen Metastasis to the lungs may occur, followed by a rapidly downhill course, and death may ensue within weeks or months

It is generally stated that osteogenic sarcoma among children is associated with a higher mortality rate than among adults[1] In a review[2] of 430 patients of all ages seen at the Mayo Clinic because of osteogenic sarcoma, it was suggested that the survival rate was equally as good among children as among adults This observation prompted us to undertake a review of the total experience with this disease among children at this institution The material obtained from this review constitutes the basis for this report

During the 50-year period, 1909 through 1958, a total of 129 children (67 girls and 62 boys) less than 16 years of age were diagnosed at the Mayo Clinic as having osteogenic sarcoma Pathologic material is available and has been reviewed, with confirmation of the diagnosis in each case Fourteen additional patients suspected of having osteogenic sarcoma were excluded because of lack of pathologic confirmation of the diagnosis

Follow-up letters dated Jan 1, 1959, were addressed to all the patients in this group, except those seen during the year 1958 and those known to have died If no reply was obtained from this inquiry, various other methods of tracing the patient were employed As a result, accurate information was obtained on 126 of the 129 patients Of the three patients untraced in 1959, two were alive 2 and 21 years respectively after amputation, while the third was alive but seriously ill 5 months after surgical excision of the tumor in 1914

Age and Sex

The distribution of patients according to age and sex at the time of diagnosis is presented in figure 1 The youngest patients were two girls aged 4 years, while 23 of the patients were 15 years of age when the diagnosis was established It is rather surprising that girls outnumber boys in this study, whereas males accounted for 62 8 per cent of the patients of all ages with osteogenic sarcoma observed at the Mayo Clinic[2]

Pathologic Features

We have employed the standard definition of osteogenic sarcoma It is a primary tumor of bone, the malignant cells of which produce osteoid even if only in small foci Some osteogenic sarcomas, thus defined, contain prominent chondroid foci that resemble chondrosarcoma Others contain large zones that simulate fibrosarcoma Some contain a rather even proportion of chondroid, fibromatoid,

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and osteoid-producing zones The majority of tumors in this series showed osteoid production throughout The amount of mineralization of the osteoid varies and is reflected in the degree of radiopacity as seen in the roentgenogram The path-

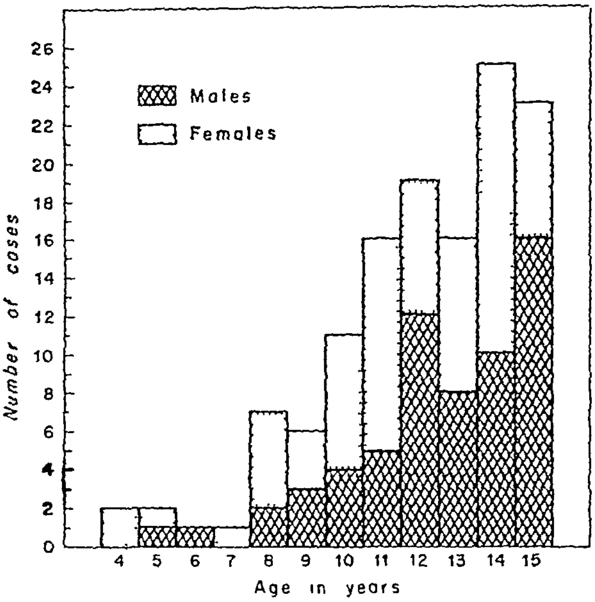

Fig 1 –Distribution of 129 patients with osteogenic sarcoma according to age and sex

ologic features of the tumors in the long-term survivors did not differ materially from those of the over-all group (fig 2)

The differential diagnosis includes parosteal osteogenic sarcoma Three tumors of this subtype were encountered, these cases were removed from the study because of the low degree of malignancy and the indolent clinical behavior of this subtype [3]

Heterotopic ossification, such as that of myositis ossificans and of ossifying hematomas, must be differentiated from osteogenic sarcoma [4] In their early phases, these lesions exhibit considerable mitotic activity Lack of cytologic evidence of anaplasia, location in soft tissue, and absence of cortical destruction as determined on stereoscopic roentgenologic study are features that suggest that a lesion is likely to represent benign heterotopic ossification The rapid transformation of the proliferating tissue into orderly, mature osseous trabeculae, especially at the periphery of the lesion, is a diagnostic characteristic Patients with this proliferative process often give a history of significant trauma In a review of the pathologic material for this study we encountered four cases in which heterotopic ossification had been originally considered to be osteogenic sarcoma

Location of Tumors

In table 1 are listed the sites of the primary tumors and the grades of the tumors observed at each site The grades assigned are based on the degree of anaplasia (1 to 4) according to Broders' index Osteogenic sarcomas have an unusual predilection for the metaphyseal ends of long bones In this series, 88 patients (68 2 per cent) had tumors that arose about the knee, whereas a total of 105 patients (81 4 per cent) had tumors that arose in the bones of the lower extremities Thirteen patients (10 1 per cent) had tumors that arose in the upper extremities, whereas only 11 (8 5 per cent) had tumors that arose from the other bones of the body

Treatment

The treatment of choice is in our opinion early surgical ablation, that is, removal of the tumor from the body There obviously is a time when metastasis from the tumor occurs and the metastatic cells implant, survive, and grow Successful surgical therapy must precede this time Our general policy has been to amputate the affected extremity as soon as possible after the correct diagnosis has been established The site of amputation depends upon the location and extent of the tumor In patients suspected of having osteogenic sarcoma of the extremities, plans are made for immediate amputation in the event the results of biopsy prove positive for this malignancy At the time of operation, two tourniquets are applied, one above the tumor and one above the proposed site of amputation After the diagnosis is established by means of fresh frozen sections of biopsy material, amputation is performed between the tourniquets This method aids in preventing possible dissemination of tumor emboli by the biopsy procedure Almost all osteogenic sarcomas contain soft parts from which the diagnosis can be made by means of fresh frozen section, provided the pathologist is adequately trained in the technique and in interpretation of the histologic characteristics of bone tumors

TABLE 1 –*Distribution of Cases According to Location of Tumor and Grade of Malignancy*

Location	Total Cases	Grade of Malignancy* 1	2	3	4
Lower limb					
Upper femur	9	0	0	4	5
Lower femur	66	0	0	35	31
Upper tibia	22	0	1	13	8
Midtibia	1	0	0	1	0
Lower tibia	5	0	1	2	2
Upper fibula	1	0	0	1	0
Upper limb					
Upper humerus	11	0	0	7	4
Midhumerus	1	0	0	1	0
Distal radius	1	0	0	0	1
Ilium	4	0	0	4	0
Pubis	1	0	0	1	0
Mandible	2	0	1	0	1
Maxilla	1	0	0	1	0
Talus	1	0	1	0	0
Spinal column	1	0	0	1	0
Rib	1	0	0	1	0
Clavicle	1	0	0	1	0
Total	129	0	4	73	52

* According to Broders Index

Amputation was performed on 101 of the 122 patients of this group who had tumors arising at sites (including the ilium) where amputation is considered possible Twenty-one of the 22 patients who survived five or more years are among the group treated by amputation Excision of the tumor was the primary treatment in six patients, no patient treated by this method alone or in combination with irradiation survived five years

Radiation therapy has, in our experience, proved of limited value in the treatment of osteogenic sarcoma It was used as the sole or primary form of therapy in 15 patients and in combination with surgical measures in many others One patient, a girl with grade 3 osteogenic sarcoma of the upper part of the humerus, has survived 34 years after radiation therapy alone, this is the only child to survive after treatment with radiation alone

Seven patients in this group received no treatment, in most instances because the disease was advanced at the time of their original visit to the Mayo Clinic

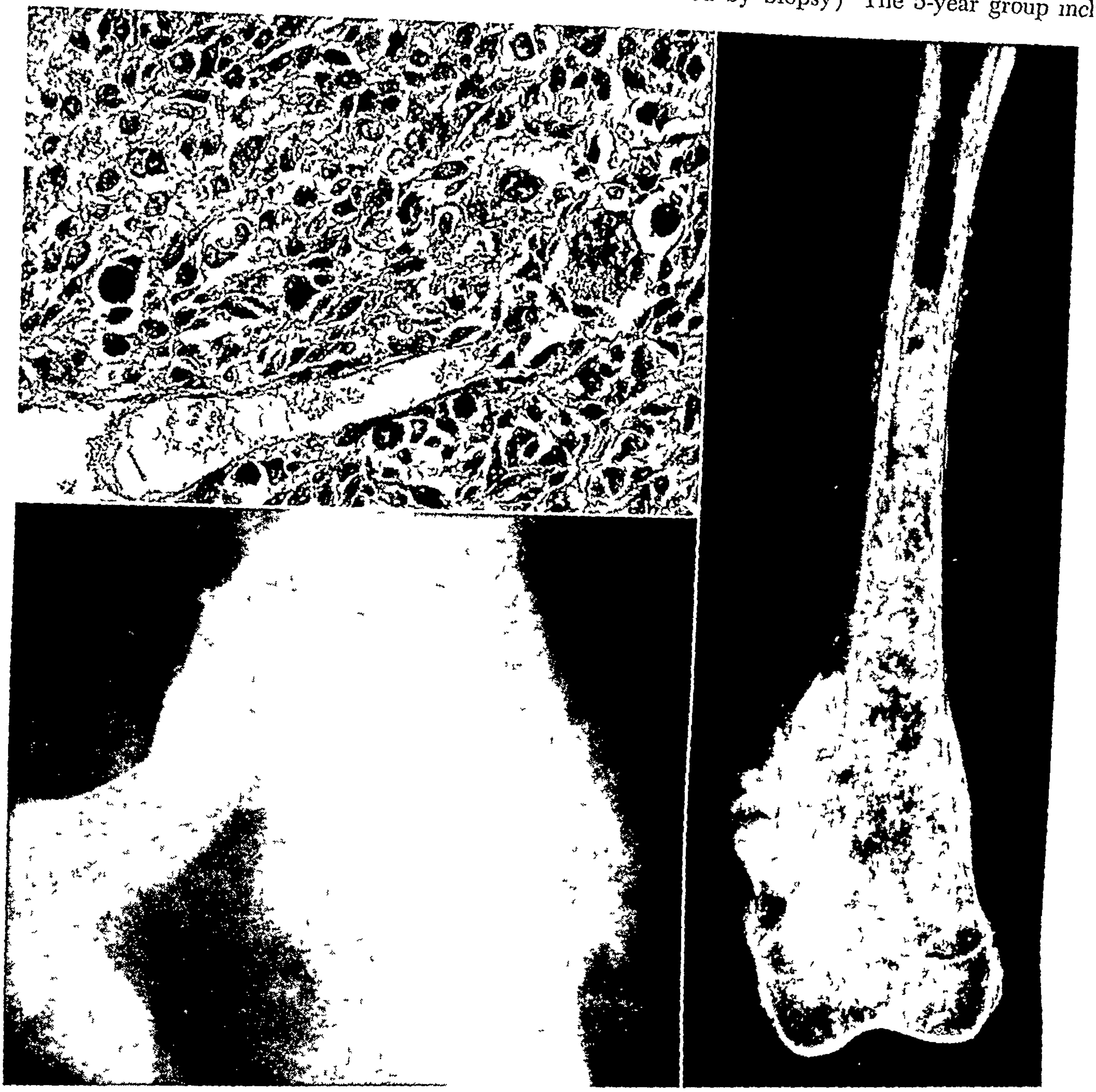

Fig 2—(Top, left) Hematoxylin-eosin stain (× 300) of specimen of grade 4 osteogenic sarcoma of upper portion of tibi taken from patient who was alive and well 6 years after amputation through femur (Bottom, left) Roentgenogram showin osteogenic sarcoma of upper end of femur in patient who was alive and well 13 years after hindquarter amputation (according to Coventry and Dahlin[2]) (Right) Cross-section of operative specimen of lower portion of femoral shaft showing osteogenic sarcoma with extension up the marrow cavity taken from a patient who was alive and well 8 years after hip disarticulation

Survival

We have used the generally accepted survival periods of 5 and 10 years (the length of survival being computed from the date the diagnosis was established by biopsy) The 5-year group includes those patients treated in 1953 or earlier, the 10-year group, those treated in 1948 or earlier The 5-year survival rate of 22 2 per cent and the 10-year survival rate of 19 5 per cent are comparable to the rates observed among the larger group of patients of all ages reported elsewhere[2] Another patient seen in early 1954, has survived for five years but is of course not included in the foregoing groups

The prognosis in osteogenic sarcoma is more favorable if the tumor arises in a site that is amenable to radical surgical treatment This is clearly demonstrated in table 2, in the five-year survival rates calculated according to site of origin of the tumors by the method already described and based on all traced patients with tumors of the indicated sites who were seen before January, 1954 Of interest is the fact that two patients succumbed to osteogenic sarcoma 8 and 15 years respectively after amputation We are unable to explain the long delay in the appearance of metastatic lesions in these patients

TABLE 2—*Five Year Survival Rate by Location of Tumor*

Location of Tumor	Patients Total No Traced	Patients Surviving 5 or More Years	
		No	%
Upper femur	6	1	16 7
Lower femur	51	8	15 7
Upper tibia	20	8	40 0
Lower tibia	4	2	50 0
Humerus	8	2	25 0
Ilium	3	1	33 3
Total	92†	22	23 9

* One additional patient lost to follow up

† Seven patients not included had tumors that arose at sites not amenable to amputation

Survival in osteogenic sarcoma appears to be somewhat related to the degree of anaplasia, since 2 of 4 patients with grade 2 tumors have survived five or more years, whereas 14 of 60 patients (23 3 per cent) with grade 3 tumors and only 6 of 35 patients (17 1 per cent) with grade 4 tumors have survived for this period

Comment

The most significant observation in this study is the fact that 22 2 per cent of the patients have survived five or more years after the diagnosis of osteogenic sarcoma was established The observation does not support the often expressed opinion that the prognosis is extremely poor among younger patients with osteogenic sarcoma Ackerman[5] has observed similar survival rates among a relatively large group of patients of all ages treated by early amputation It is our opinion that the previously expressed pessimism was based on observation of too few patients treated in a uniform manner

Some observers,[1 6] influenced by the prevalent undue pessimism, have recommended irradiation either alone or in combination with amputation Sufficient data are not available to allow adequate appraisal of these methods of management, but we fear that delay of definitive surgical treatment for preoperative radiation therapy adds the hazard of possible dissemination of the disease

We are aware of the psychologic trauma to both the patient and the family (and also to the physician) that is associated with amputation in the young individual On the other hand, all the patients of our study who have survived five or more years after amputation have made satisfactory psychologic adjustments It should be remembered that in some instances amputation has been performed as a palliative procedure for the relief of pain As noted previously, we believe early surgical ablation is the treatment of choice for children with osteogenic sarcoma

Summary and Conclusion

One hundred twenty-nine children less than 16 years of age with pathologically verified osteogenic sarcoma have been seen at the Mayo Clinic during the 50-year period, 1909 through 1958 Accurate follow-up information is available on 126 of the 129 patients Data on the age and sex of the patients, location of the tumor, grade of malignancy, type of treatment and survival are presented Amputation was the primary form of therapy in 101 patients Radiation, alone or in combination with surgical management, was the treatment given in 15 patients, whereas excision of the tumor was carried out in only six Seven patients were not treated The survival rates among children with osteogenic sarcoma are influenced by the degree of malignancy of the tumor, the location of the tumor, and the type of therapy administered In our opinion, early amputation is the treatment of choice in patients whose tumors arise in the extremities and who do not manifest evidence of metastasis The over-all 5-year and 10-year survival rates among the patients traced were 22 2 and 19 5 per cent, respectively Patients of this study with tumors arising in the tibia have a five-year survival rate of approximately 41 per cent, while 15 8 per cent of patients with tumors of the femur have survived five or more years No patient survived five years with a tumor arising at a site that precluded amputation The observations made in this study are in accord with those made in an earlier study of 430 patients of all ages seen at the Mayo Clinic because of osteogenic sarcoma

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COUNCIL ON FOODS AND NUTRITION

Quality and Safety in Frozen Foods

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Frozen foods are acquiring an increasingly important place in the American diet Annual per capita consumption has risen from 6 to nearly 30 lb since World War II Modern industrial practices and research have continuously improved quality Although frozen foods are not always free from potentially hazardous micro-organisms, their safety record compares favorably with that of other successfully preserved products At present, vigorous action is being undertaken to correct improper handling procedures that result in quality losses

Quality and Nutritive Value

Nutritional values of fresh foods generally are well retained during the freezing process[1,2] Techniques employed by producers and packers to protect color, flavor, and salability of a food also protect natural vitamin and mineral content as no other means of preservation can do In good commercial practice, crops are harvested at prime maturity, often with a delay of only three to four hours between harvesting and freezing operations Prolonged contact with water is avoided Fruits are packed under a sugar syrup with added ascorbic acid to retard oxidation and development of "off-colors" Poultry is killed, bled, dressed, and chilled, then frozen before any decomposition due to microbial action can occur

In the late 1940's high-quality products sometimes deteriorated seriously between the freezing plant and the retail checkout counter Zero degrees Fahrenheit long had been accepted as the maximum temperature at which frozen foods should be held, but surveys of commercial storage and distribution showed that higher temperatures were the rule rather than the exception

Comprehensive data were lacking on differences in deterioration of frozen foods held at various temperatures Upon request of the industry, in 1948 the United States Department of Agriculture's Western Regional Research Laboratory, at Albany, Calif, undertook an extensive study of frozen foods[3] Emphasis was on changes in "quality", that is, color, flavor, and texture, rather than on nutritive value Oxidation of ascorbic acid in frozen fruits and vegetables also was investigated, since it runs somewhat parallel to quality losses Thus far, the studies have covered principal frozen fruits, vegetables, poultry, precooked foods, and baked goods Little work has been done with red meats because they are not commonly distributed in frozen form

Frozen foods were found to be remarkably sensitive to temperature increases Whereas most chemical reactions are 20 to 35% more rapid when the temperature rises 5° F, certain deteriorative reactions in frozen foods may double, triple, or even quadruple their rates with such a temperature rise Products differ in stability at different temperatures For example, at 10° F detectable deterioration occurs in peaches in six weeks, whereas such a change may not take place in poultry for six months

Since commercial refrigeration facilities often are used for a wide variety of products at one time, a temperature should be maintained that will adequately protect the most perishable items, such as peaches and certain precooked foods Deterioration gradually occurs even at 0° F, but at this temperature even less stable products, if packaged suitably, retain high quality for many months Under normal conditions of turnover of commercial stocks, frozen foods held continuously at 0° F or below will reach the consumer in excellent condition One or two brief exposures to higher temperature—a few days at 10° F or a few hours at 20° F—do not cause appreciable harm On the other hand, surveys throughout the industry uncovered some combinations of time and temperature which produced quality deterioration serious enough to cause consumer dissatisfaction and complaints

As a means of improving the quality of frozen foods reaching the consumer, the Association of Food and Drug Officials of the United States (A F D O U S) is developing a frozen food-handling code[4] This will require frozen foods to be held at 0° F or below, with only brief excursions to slightly higher temperatures, until sold to the consumer The code will not have the effect of law but will be offered as a guide to lawmakers preparing state and local ordinances Meanwhile, nine industrial associations, representing processors, transportation companies, distributors, and retailers, are

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From the Western Regional Research Laboratory a Laboratory of the Western Utilization Research and Development Division, Agricultural Research Service, United States Department of Agriculture

The Council has authorized publication of the following report

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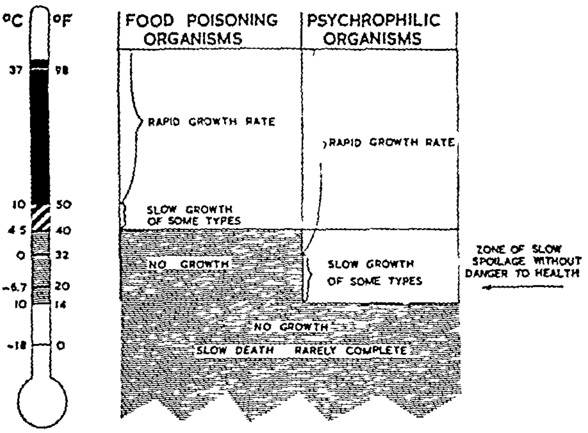
collaborating in the development of voluntary standards for industry practice.

Microbiology and Parasitology

Quality defects in frozen foods most commonly are caused by chemical and physical changes. Microbial activity can occur, however, if products are held at high temperatures. Bacterial activity declines in chilled foods. Mesophiles (pathogens and others preferring moderate temperatures of growth) usually cannot grow at temperatures maintained in an ordinary household refrigerator. Fortunately, food poisoning organisms are in this group (see figure). Therefore, any microbial growth in foods held at 40° F or below will cause spoilage but will not endanger consumer health. Many investigators have observed the growth of yeasts, molds, and bacteria in commercial frozen foods at temperatures as low as 14° F. The minimum growth temperature varies with the nature of the food and the species of micro-organism present.



Low temperature limits on growth of food poisoning and psychrophilic organisms

Many bacteria are killed in the freezing process or in subsequent storage. If the storage temperature is too low for growth of psychrophilic spoilage organisms, viable count will drop first rapidly, then gradually. A considerable number remain alive, however, even after prolonged storage and can cause spoilage after the food thaws.

A few types of food poisoning organisms are regularly present in many frozen foods. They come from surfaces of raw meats and poultry (salmonella, paracolobactrum, clostridium), from the hands of workers (staphylococcus, enteric organisms), or from soil (clostridium). To cause trouble, an organism ordinarily must multiply to massive numbers. This occurs only under grossly inadequate refrigeration, for example, 50° to 100° F for several hours. Whether a food so treated becomes dangerous depends in large degree on its nature. Raw meats often harbor salmonellae and related enteric pathogens, but cooking will destroy them. The principal danger in raw meats is contamination of other, more susceptible products in the kitchen.

Although salmonellae artificially inoculated into fruits may live for many months in frozen storage, they cannot grow in such surroundings and die rapidly after the fruits are thawed.[5] This is true also for thawed vegetables held at temperatures that would allow the growth of pathogens, because the spoilage bacteria remaining alive form acid which prevents growth of enteric pathogens and *Clostridium botulinum*.[6]

Trichinella spiralis, while not a bacterium, is a recognized danger in pork. It is of pertinent interest that it dies readily on freezing.[7]

The inherent protective mechanisms found in frozen raw meats, fruits, and vegetables are not present in frozen precooked foods of a moist, bland, neutral nature, such as poultry pies and prepared dinners. Few incidents of food poisoning have been reported, probably because spoilage usually occurs before food poisoning organisms become numerous. Theoretical possibilities of outbreaks, however, are inherent in these precooked foods. They often are contaminated with bacteria in the food plant after they are cooked and offer ideal conditions for bacterial growth. Initially minute inocula can develop into massive numbers of bacteria unless cooked products are handled rapidly and kept cold. Several investigators have demonstrated the potential danger of mishandling. Straka and Combes[8] grew staphylococci in creamed chicken held at elevated temperatures. Proctor and Phillips[9] succeeded in growing alpha-type streptococci and *Salmonella enteritidis* in four types of precooked foods held at 86° F. Saleh and Ordal[10] grew *Clostridium botulinum* in chicken a la king at 86° F. Thorough heating of a precooked food by the housewife always is advisable.

In the past 10 years, the precooked food business has become severely competitive. Firms with mass production and laboratory control can maintain low bacterial levels and, thus, the best flavor in their products. They have pushed out or absorbed many smaller firms who still used kitchen methods without such control.

A better average market product has resulted, but much still must be done to improve quality of the products of some firms with respect to bacteria control. Increased awareness of the problem is reflected in the present lively controversy on the advisability of bacteriological standards. Fitzgerald[11] first suggested them in 1947, but it was not until recently that others have taken up the issue. Rayman and his co-workers and Abrahamson favor standards, whereas Thatcher, Dack, and Ingram have pointed out difficulties involved in interpreting and enforcing them.[12-17]

Most food-law agencies hesitate to impose blanket bacteriological standards without adequate supporting data. For this reason A.F.D.O.U.S. and the National Association of Frozen Food Packers recently conducted a nationwide laboratory survey to determine existing bacteriological conditions in the precooked frozen food industry In June the National Academy of Sciences of the National Research Council sponsored an international conference to discuss microbiological standards A F D O U S has not yet agreed to incorporate a microbiological standards section in their new code Individual firms have sometimes set their own limits, however, and official standards have been incorporated into specifications of the Quartermaster Corps[18] and regulations of New York City[19] and Massachusetts[20]

Summary

Frozen foods handled according to good commercial practice are safe, nutritious, and flavorful Defects from improper or prolonged frozen storage are primarily chemical or physical, bacterial spoilage occurs only upon gross mishandling Food poisoning organisms do not grow in chilled or frozen foods held at temperatures under 40° F *Trichinella spiralis* dies out rapidly in frozen pork Food law officials and industry associations are taking vigorous action to improve commercial handling of frozen foods

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Symposium on Clinical Nutrition

A symposium "Clinical Nutrition" will be held in Washington, D C, Nov 30, 1960 This symposium will be sponsored by the Council on Foods and Nutrition with the cooperation of The Medical Society of the District of Columbia

The program, which will begin at 9 A M Wednesday, Nov 30, will be held in Room B of the National Guard Armory The meeting will be open to all interested persons, and there will be no registration fee

The following program has been arranged

Panel I—The Diagnosis of Nutrient Deficiencies

9 00 A M	Moderator Dr JOHN B YOUMANS, Director, Division of Scientific Activities, American Medical Association A The Clinical Appraisal
9 10 A M	by Physical Examination Dr WILLIAM J MCGANITY, Chairman, Department of Obstetrics and Gynecology, Medical Branch, University of Texas
9 40 A M	by Biochemical Evaluation Dr WILLIAM N PEARSON, Assistant Professor, Department of Biochemistry, Division of Nutrition, School of Medicine, Vanderbilt University
9 50 A M	by Anthropometric Evaluation Dr STANLEY M GARN, Chairman, Physical Growth Department, the Fels Research Institute
10 10 A M	B The Dietary Appraisal Dr GEORGE V MANN, Associate Professor of Biochemistry, Assistant Professor of Medicine, School of Medicine, Vanderbilt University
10 40 A M	Intermission

Panel II—The Management of Dietary Inadequacies

10 50 A M	Principles—Food or Supplement? Dr ROBERT L JACKSON, Chairman, Department of Pediatrics, University of Missouri
11 20 A M	Round Table—Can the Physician Bring About a Correction of Dietary Habits? Dr ROBERT E OLSON, Professor and Head of the Department of Biochemistry and Nutrition, Graduate School of Public Health, University of Pittsburgh, and Dr Jackson, Dr Mann, and Dr McGanity

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SPECIAL COMMUNICATION

Blood Groups and Human Genetics

Robert R Race, Ph D , F R C P , F R S , London, England

Blood groups used to mean the divisions made by the presence or absence of red cell antigens Nowadays this seems rather a limited use of the term for blood can be grouped in several other ways for example by the antigens of the white cells, most of which promise to be quite different from those of the red, by the antigens of the platelets, by the Gm antigens of the plasma, and by the chemistry of the hemoglobins and haptoglobins and transferrins A new and most surprising way of dividing blood into two groups has recently been described by Steinberg and Giles these authors find that samples of human plasma can be divided into two groups—those which do, and those which do not, inhibit a curious agglutination reaction which occurs when two mating types of the yeast *Hansenula wingei* are brought together It looks very much as if the ability to inhibit will prove to be a simple dominant character When this work is established, a new level of blood grouping will be clamoring for investigation

But I can speak only of blood groups in the old-world sense, the sense of about ten years ago when blood groups meant red cell antigens

Table 1 contains a list of 65 blood group antigens that have been identified on the human red cell Except for the last two rows, these antigens fall into 11 separate genetic systems Some of the antigens of the last two rows, when more completely investigated, will probably prove to be heralds of new systems

These antigens provide ideal examples of Mendelian inheritance Practically all the blood group antigens of which the inheritance has been well worked out have proved to be simple, uncomplicated, dominant characters The expression of some of the antigens can be influenced by modifying genes and the expression of some of the antigens can be influenced by the environment, of this I shall speak later There is no proved example of a blood group antigen that is a straightforward recessive character

A dominant character is one which is expressed whether the gene responsible for it is in the single heterozygous state or in the double homozygous state For example the Rh antigen D is perfectly well developed whether the owner of the antigen is heterozygous *Dd* or homozygous *DD*

Some antigens are detectably stronger in the homozygote than in the heterozygote But this does not alter their being labeled dominant characters, because Mendel's original definition of dominance allowed for such slight quantitative differences, which are presumably the result of gene dosage

I said that practically all these antigens are simple, uncomplicated dominant characters The practically" was put in because a few qualifications are needed The antigen P^k provides a good example of a qualification P^k is an extremely rare member of the P system, in fact it has been found so far in only two families The first examples were sent to us by Dr Matson and Mrs Swanson from a Finnish family in Minneapolis, and the second examples, curiously and perhaps significantly, were sent from a Finnish family in Finland [4] No relationship can be traced between the two families

Figure 1 shows the Finland family Although P^k is so rare, it is of particular interest in its inheritance This pedigree is an almost perfect example of the inheritance of a recessive character, neither parent has the character, and one in four of the children has it

But we do not believe it is really a recessive character We do not believe it takes two P^k genes to produce P^k antigen This is simply prejudice, because now that the Lewis red cell antigen, Le^a, is no longer believed to be a recessive character, there is no example, as far as I know, in man or animals of a red cell antigen that is a straightforward recessive character If we won't have it as a recessive we must think up another genetic mechanism, and the one we favour at present is that the gene P^k in single dose, can, like other blood group

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From the Medical Research Council Blood Group Research Unit The Lister Institute

The Third John G Gibson II Lecture read April 28 1960 before the College of Physicians and Surgeons Columbia University New York City genes, produce its antigen, but that for some unknown reason it cannot produce its antigen when its fellow gene is either of the two common alleles in this system, namely P_1 or P_2 We think it probable that the genotype of these P^k people is P^kp p is a very rare allele that is not known to produce any antigen

TABLE 1—*Blood Group Antigens in Man*

System	Antigens Detected By: Positive Reaction with Specific Antibody	Antigens Detected By: Positive Reaction with One Antibody, Negative with Another
A_1A_2BO	A_1,B,H	A_2,A_3 A_x
MNSs	M,N,S,s,Mi^a,Vw,Hu,He,M^g,Vr,M_1	M_2,N_2,M^c
P	P_1,P^k	P_2
Rh	D,C,c,C^w,C^x,E,e,e^s,E^w G ce,ce^s, Ce CE	D^u,C^u E^u
Lutheran	Lu^a,Lu^b	
Kell	K,k,Kp^a	
Lewis	Le^a Le^b	
Duffy	Fy^a,Fy^b	
Kidd	Jk^a,Jk^b	
Diego	Di^a	
Sutter	Js^a	
'Private'	Levay Becker Ven,Wr^a,Be^a,Rm, By,Sw^a	
'Public'	Vel,Yt^a,I,Ge	

The problem may be settled when more families have been found In neither of the two families so far tested were the parents cousins If in future families there are too many cousin marriages among the parents of the propositi, then we will have to come round and believe that a positive character like P^k can be recessive

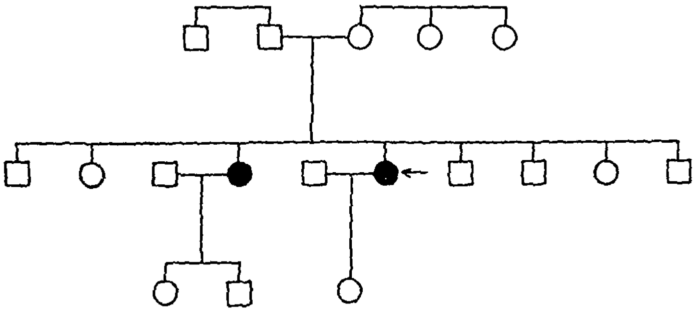

Fig 1—Inheritance of antigen P^k (from Kortekangas, Noades, Tippett, Sanger, and Race), *black*, P^k antigen, *white*, no P^k antigen, *arrow*, propositus

So much for the inheritance of individual blood group antigens, the majority are inherited as straightforward dominant characters But the precise mechanism of inheritance of the systems, at any rate of the complex systems like MNSs and Rh, is still in doubt

We used to consider that three genes, *C*, *D*, and *E*, were responsible for Rh, three closely linked sites where mutation could occur But modern genetic work on phage, bacteria, and molds has altered our ideas so fundamentally that we now have to think in terms not of genes with single mutational sites but of cistrons with several hundred mutational sites

Whether one or more cistrons are involved in Rh is already becoming a matter for inquiry If we begin by allowing it only one cistron, we can speculate that part of its length is occupied by mutational sites devoted to the specifying of D, another part of its length to sites specifying C, and another to sites specifying E We think we have some evidence that *C* and *E* are in the same cistron

Finding New Antigens

Progress in blood group classification usually begins with the finding of a new antibody which has disclosed itself, say, during cross-matching tests prior to transfusion The problem then arises whether the new antigen thereby defined belongs to one of the established blood group systems or whether it represents a new system The question can only be decided by blood-grouping families who have the antigen

Figure 2 gives an example of a new antigen that was shown to belong to the MNSs system by this Dutch family[3] Black represents the new antigen, which is called Vr The father is heterozygous for the new gene because some of his children lack Vr (had he been homozygous he would have given Vr to all his children) Vr has gone to all the five children who have received their father's *M* chromosome On the other hand, the four children who have received their father's *N* chromosome lack Vr, they have evidently received his "*not-Vr*" gene

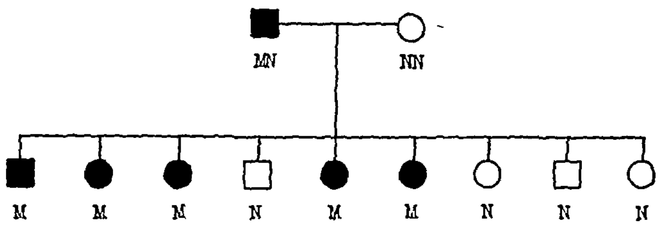

Fig 2—Shows that antigen Vr belongs to MNSs system, *black*, Vr antigen, *white*, no Vr antigen M or N under children represents their father's contribution, to each the mother gave N, which is left out for clarity (from van der Hart, van der Veer, van Loghem, Sanger, and Race)

The probability of this association being due merely to chance is 1 in 126, but this remote possibility of chance being responsible is ruled out by the addition of five scorable children in a third generation of this family which is not shown in the table The final probability that the association is due to chance is only 1 in 3,000

Only some families can give this sort of information If, for example, the father had been group M he would have given M to all the children and there would have been no hint that Vr belonged to the MN system

With luck, as in this example, it may be easy to show that a new antigen belongs to an established system, but it is a very much more laborious task to prove that a new antigen represents a new system It depends on showing that the gene responsible is inherited independently of the genes responsible for all the systems known at the time Families of two or more children are needed to show independent segregation of two genes, and only certain mating types can do so

The family shown in Figure 3 has the antigen Sw^a discovered by Cleghorn The antigen, although a recent find, is well on the long road to achieving systemic status I am grateful to Dr Cleghorn for permission to use this unpublished pedigree The propositus, marked with an arrow, is a donor to the South London Blood Transfusion Service at Sutton He was discovered to have a new antigen when, by an extraordinary coincidence, his cells were cross-matched with the serum of the patient who happened to have the new antibody, now called anti-Sw^a The antigen is extremely rare Dr Cleghorn found only three more examples in testing about 30,000 random donors The antibody, on the other hand, Dr Cleghorn is finding to be quite frequent

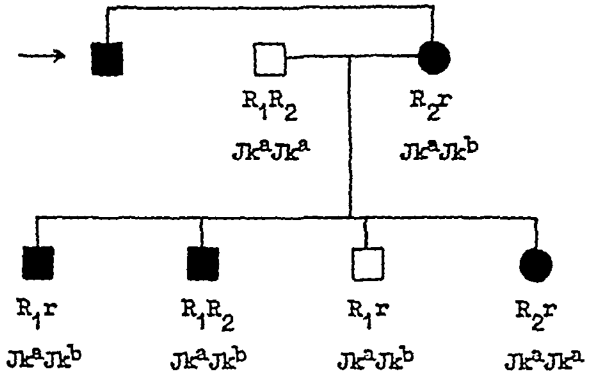

Fig 3—Shows that antigen Sw^a is independent of Rh and Kidd systems (after Cleghorn), *black*, Sw^a antigen, *white*, no Sw^a antigen, *arrow*, propositus

It is of interest that this donor, whose name, Swann, has been used for the antigen, is known to the general public, naturally it would have to be for another reason—he is Donald Swann, the pianist in the performance called “At the Drop of a Hat’ now playing in New York

This branch of the Swann family demonstrated that their antigen does not belong to the Rh or Kidd systems The sister of the propositus is heterozygous for the gene responsible, for she has one child who lacks the antigen The first two children suffice to show that Sw^a is not part of Rh the mother has given her Sw^a gene to the first child with her *r* gene and to the second child with her R_2 gene If Sw^a were part of the Rh gene complex, it would have to travel with one or the other of the mother s *Rh* genes, it could not travel with both It could only travel with both if she were homozygous for Sw^a, which she is not

Kidd is ruled out in the same way, and the first and last children will show it to the first child the mother has given her Sw^a gene with her Jk^b gene, and to the last child she has given her Sw^a gene with her Jk^a gene

From his study of the Swann family and the families of two of the three other examples in the 30,000 tested, Dr Cleghorn has been able to show that Sw^a does not belong to the ABO, MNSs, Rh, Kell, Duffy, Kidd, or secretor systems The P and Lutheran systems remain to be excluded It is now very likely that the antigen does represent a new blood group system, in which case it will serve to mark one more point on the human chromosomes

Linkages and Chromosomes

Blood grouping, as you know, has several applications, but now I would like to speak about one which is of particular interest in the study of human genetics the use of blood groups in mapping chromosomes When two genes are fairly close to each other on one chromosome, the characters which they represent may be seen traveling with each other through the two or more generations of the family being studied

Several genes are known which are carried by the X chromosome hemophilia, red-green color blindness, and one form of muscular dystrophy are examples of such sex-linked genes But we know of only three pairs of linked genes carried on the 22 autosomes, and one member of each of the three pairs is a blood group gene This shows how very slight is our knowledge of the cartography of the germ plasm of man, but it also shows what a big contribution the blood groups have made to what we do know

The first autosomal linkage in man was discovered by Mohr in 1951 Mohr thought the linkage was between the Lutheran blood group genes and the Lewis blood group genes but now that certain interactions between the Lewis and secretor genes are understood, it is clear that the linkage is in fact between the Lutheran blood group genes and the secretor genes (The secretor genes control the presence or absence in the saliva of the ABO blood group substances)

Figure 4 shows one of the families that helped to prove the linkage[5] The father is a most distinguished geneticist, the Professor of Botany at Oxford

Families capable of disclosing this linkage are rare One parent has to be heterozygous for both the Lutheran and the secretor genes, and the destination of this parent's genes in the children must be clear Most families are no good because both parents are homozygous Lu^bLu^b, only about 7 per cent of people are Lu^aLu^b Furthermore most families are too small to be very informative even if the gene segregation is of the right kind

But this family is of the type capable of showing linkage The mother is doubly heterozygous, heterozygous for the Lutheran and for the secretor genes, and the destination of her genes is clear and is not being obscured by the genes of her husband

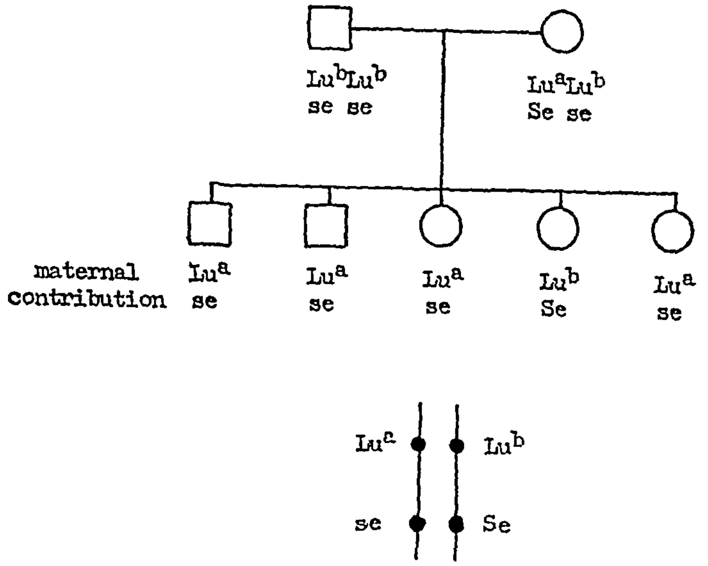

Fig 4—Autosomal linkage between Lutheran blood group genes and secretor genes *(from Sanger and Race, 1958)*

The husband can give only Lu^b and *se*, and I have not entered this under the children so that the maternal contribution may stand out more clearly You will notice that on the four occasions when the mother has given her Lu^a gene to a child she has given with it her *se* gene, and on the one occasion when she gave a child her Lu^b gene she gave it a *Se* gene

Under the pedigree is a diagram showing how the mother's genes are arranged on the chromosome pair involved In this family, Lu^a is on the same chromosome as *se* In the next family we will see Lu^a again traveling with *se*, but this is a matter of chance In other families the Lu^a gene is traveling with the *Se* gene

The family shown in Figure 5,[3] unlike those of the last two figures, is of no artistic, scientific, or social consequence whatsoever Nevertheless, the mating is of the same type, with respect to the Lutheran and secretor genes, as that of the last pedigree One of the parents, again the mother, is heterozygous both for Lutheran and secretor genes and we can see where all four of her genes are going Again I have left out the father's contribution to the children which can only be Lu^b and *se* Excluding for the moment the last child, you can see that on five occasions the mother gave here Lu^b gene with her *Se* gene and on one occasion her Lu^a gene with her *se* gene This shows that the mother's genes are lined up as in the diagram below But the last child does not obey the rule

You may remember that in the formation of the sex cells, at meiosis, the two chromosomes of each pair coil around each other and then retract from each other to opposite poles of the spindle This retreat pulls out the coils, and both chromosomes may break, at the same level where they cross, and a broken end may then join up with the loose end of the opposite chromosome This is called crossing-over I say you may remember, but it does not matter very much whether you remember or not, because I believe the latest opinion is that this is how crossing-over does not happen

Although the mechanism is now in doubt, the existence of crossing-over is unquestioned In the formation of the ovum that produced the last child in this pedigree (Figure 5) there has been a cross-over somewhere between the two genes, and the part marked by Lu^a has joined up with the part marked by *Se* The reciprocal chromosome, Lu^b *se*, produced at the same crossing-over, would go into a polar body and thence into limbo

Crossing-over occurs more or less at random along the chromosome, so that the greater the distance between the two genes the greater is the chance of crossing-over happening between them So it follows that we can use the frequency of recombinations between the two linked characters as an index of the distance between their two genes

The cross-over rate between the Lutheran and secretor genes is found to be about 13 per cent, so the two genes are said to be 13 units apart

Dr Sylvia Lawler and her colleagues at the Galton Laboratory in London have found that the gene for oval red cells is on the same chromosome as Rh—and about 10 units away from it Another search for linkage made by the Galton Laboratory has been rewarded Renwick and Lawler have discovered that the gene responsible for a rare dominant condition called "nail-patella syndrome" is on the same chromosome as the ABO locus Six large families showing the abnormality were tested, and the linkage was beautifully demonstrated The genes are about 10 units apart

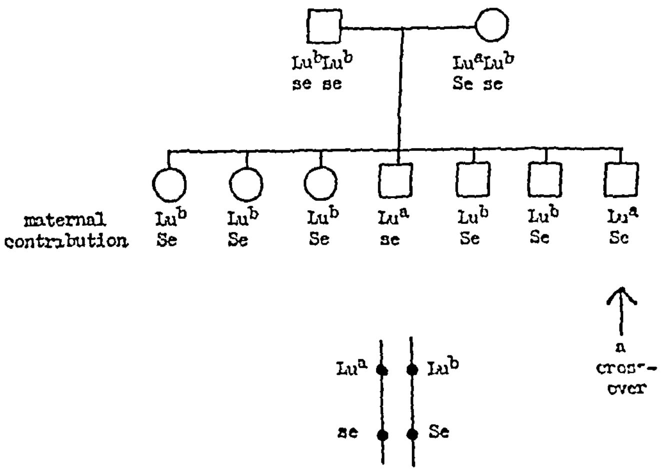

Fig 5—Another linkage between Lutheran blood group genes and secretor genes (from Sanger and Race, 1958)

Figure 6 is a summary of the autosomal linkages so far discovered It is only in the last ten years that the long and arduous search for autosomal linkage in man has been thus rewarded But, now, with more good marker genes such as blood group genes, serum group genes, and hemoglobin genes, linkages should be found thick and fast, and there will be something to put into figure 7

As early as 1940, attempts had been made to identify and number some of the larger human chromosomes But enormous strides have been made in the last two or three years in improving methods for making the chromosomes visible Our great contributor to the subject is C E Ford of Harwell As a result, the numbering of all the chromosomes is now a reality, as you see here Experts distinguish them by their size, by the position of the centromeres, and by the possession, by two of the pairs, 14 and 21, of attached satellite bodies

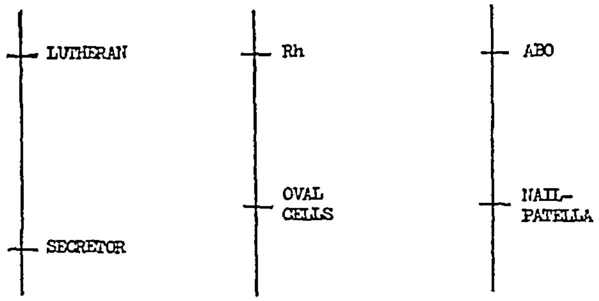

Fig 6—Autosomal linkages

Something is already known about what they do Of course it was known long ago that this pair, the X and Y, played the male part in controlling sex, but more is known now, and I am sure you are familiar with the wonderful recent work which has shown that Klinefelter's syndrome is the result of having two Xs and one Y, Turner s syndrome the result of having only one X and no Y, and that if a person has three No 21 s, instead of the usual pair, he is a mongolian idiot A case has even been reported of a mongol who, in addition, has Klinefelter s syndrome, when his chromosomes were examined there could be seen, as expected, the extra X and the extra No 21

About three weeks ago a paper appeared in the *Lancet* describing how, when the chromosomes of an apparently typical mongol were inspected, no extra 21 was to be seen She had only 46 chromosomes in all, the normal number But one of her two No 14 chromosomes was longer than it should be, the authors considered it very probable that the extra 21 had become incorporated, by translocation, into this No 14 chromosome, thus accounting for its abnormal length

The next step is to transfer the linkage groups of the last table to their appropriate chromosome number—to find out which is the number, for example, of the Rh chromosome, and whether the Rh gene is above or below the centromere and whether the oval cell gene known to be linked to *Rh* is between *Rh* and the centromere or distal to *Rh*

The attributing of genes to the sex chromosomes is relatively easy, and the position of a number of genes on the upper non-homologous part of the X is known But I can only give you an unsuccessful example of one way in which autosomal genes will eventually be assigned to their proper number in the autosome pairs A poor old woman called Abigail was in a female ward of a Newcastle hospital when a patient in a bed opposite said, 'That woman's a man" This caused quite a disturbance and Dr Armstrong was called in As a result the patient opposite was proved to be 50 per cent right, for eventually a laparotomy was needed and it was found that Abigail was a true hermaphrodite with both testicular and ovarian tissue

Dr Armstrong sent us some of Abigail's blood She had an ABO group which was so unusual that it had not at that time ever been reported before in a human being (it had, I believe, in the horse) Her red cells had no B antigen, but her saliva contained B Her two oddities, of sex and of blood group, are both so rare that it was difficult to believe that they could be coincidental Now the story collapses It was highly reasonable to suppose that Abigail's ambiguous sex could be due to some visible chromosomal upset But so far her chromosomes have appeared disappointingly normal But suppose she had had an abnormality of, say No 16, a piece visibly missing, or a piece added, or one chromosome instead of two, then this would have made it very likely that the ABO gene was on No 16 also, and since ABO is linked to the nail-patella gene it too would then be consigned to No 16 Or it might be that the oddity in Abigail's group reflected up-

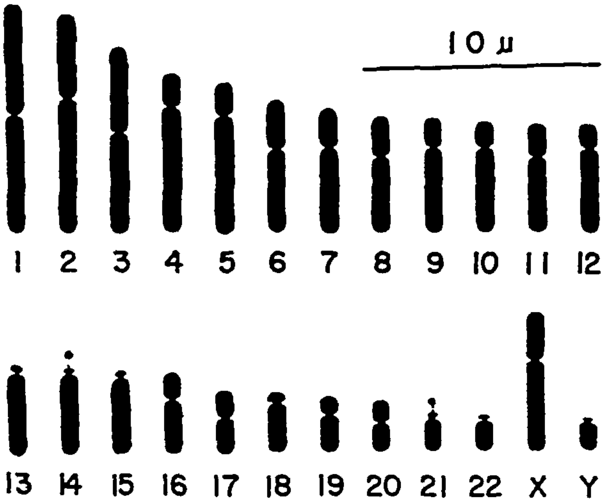

Fig 7 –Ideogram of human haploid chromosome complement, including sex pair Autosomes are arranged in order of decreasing total length and of relative centromere positions If two chromosomes are of equal length, one having more nearly median centromere is placed first (Reproduced from Chu and Giles[1])

heaval in her saliva ABO secretor gene (rather than her ABO red cell gene) and in this case the secretor gene would bring with it into the, say, No 16 chromosome the Lutheran blood group gene with which it is known to be linked

Though Abigail disappointed us, this sort of thing is bound to happen very soon, and once one gene gains a bridgehead on a chromosome its linked fellows will swarm in We are just about to emerge from the stage when all we can write on the map of the human autosomes is "here are genes" The map of the autosomes is about to change from its present complete blankness and begin to look more like the map of the four chromosomes of Drosophila which is thickly crowded with genes

When a reasonably detailed map of the human chromosomes is achieved, what then? Well, of course, we cannot possibly foresee what further knowledge will be built on such a foundation, we can only guess at some of the possibilities that are almost within sight

It would, for example, be useful to be able to recognize the carriers of genes for certain inherited diseases that have their onset later in life *Huntington's chorea and Altzheimer's syndrome*, for example, do not come on until an age when the doomed person has probably had his children As both diseases are dominant characters, one-half the children will suffer when their time comes—but there is no way of telling which half Linkage with a marker gene, however, perhaps a blood group gene, might enable the carriers to be recognized early, so that they could avoid having children

This is the traditional example of the usefulness of human chromosome maps But it always sounds to me rather a feeble justification of the search on which we are so intent A more important consequence of chromosome maps will, I am sure, be their use, combined with the results of direct inspection, in the identification of chromosomal abnormalities

But I don't think it is necessary to struggle to think up excuses for exploring the least known and the most important part of man—his chromosomes, after all, they are the immortal part

Modification of the Expression of Blood Group Genes

Genetic.—For a time it seemed that blood group genes expressed themselves willy-nilly They seemed to be independent of other genes in the body and of the environment

Then, in 1930, it was realized that other genes influenced their expression, when it was discovered that if A and B antigens were to be present in saliva, another gene, the secretor gene, had to be present The secretor gene was quite independent, genetically, of the blood group genes In 1955, Dr Philip Levine and his colleagues made the more surprising discovery that a gene, which they named *X*, had to be present before blood group genes could express themselves as blood group antigens on the red cells

In Figure 8 the person marked with an arrow has the abnormality which has come to be called "Bombay" because the first examples were found in that city Bombay red cells have no ABO group at all This family gave the *explanation* Although the person marked with an arrow has no ABO antigens she must have normal genes for she has given a *B* to her first child and an *O* to her second That her genotype is *BO* is further supported by the groups of her parents The inhibition is genetic because this Bombay person had a sister of the same type, who is not shown in the pedigree

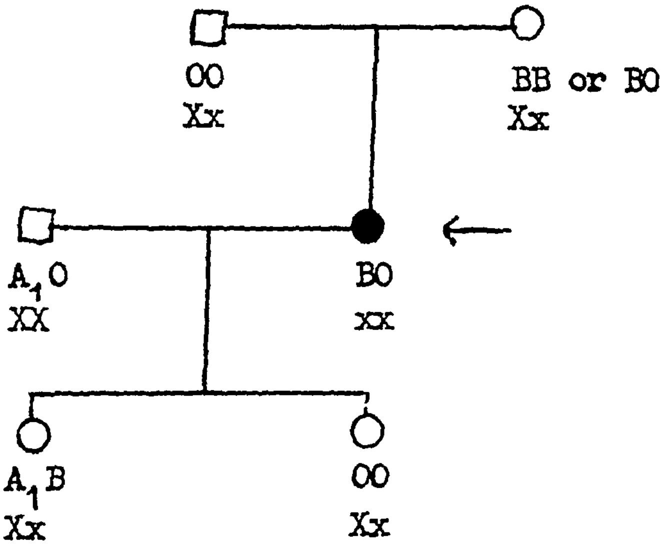

Fig 8.—First cousins, explanation of inhibition of B and O (after Levine, Robinson, Celano, Briggs, and Falkinburg)

The *X*s in the pedigree give the explanation An extremely common modifying gene, called *X*, which is necessary for the expression of the *B* and *O* genes as antigens, must exist *X* has a very rare allele, *x* When no *X* is present, as in the homozygote *xx*, the *B* and *O* genes cannot express themselves as antigens Since *x* must be extremely rare, a mating of two people carrying it must be extremely rare squared, but, as so often happens when husband and wife carry a rare gene, these two people were found, on inquiry, to be first cousins

This remarkable family gives still more information It shows the *Xx* genes are not part of the ABO genes nor very closely linked to them Since these two people are cousins, their rare *x* genes are presumably identical and inherited from one grandparent If the *X* genes were part of the *ABO* locus, or very closely linked to it, these two identical *x* genes would have to be traveling with identical *ABO* genes But this they are not doing, for one of the Bombay person's *x* has come from her mother with a *B*, while the other has come from her father with an *O*

Environmental –So much for the modification of the action of a blood group gene by *other* genes *in* the body

There is an interesting modification, the cause of which cannot yet with absolute certainty be ascribed to the environment or to gene action It occurs in certain people with leukemia There have now been at least four examples of people of group A whose red cells during the course of the leukemia lose their ability to be agglutinated by anti-A This could be environmental, the red cells having been damaged as a consequence of the disease Alternatively it has been suggested, particularly by French workers, that somatic mutation has occurred at some stage to the A gene and that some parts of the marrow are making A cells and other parts O cells, and that at various phases of the disease, different parts of the marrow take turns to produce their own brand of red cells This to me seems rather too farfetched and I find it easier to think of the lack of agglutinability as due to damage to the A This view is supported by some serological evidence that, though the A cells lose their ability to be agglutinated by anti-A, they do not lose their power to combine with anti-A, in other words, they are still A cells Provided this observation is true, it would seem to disprove the mutation idea

It was not too much of an effort to imagine a person losing a blood group in this way, but it did go rather against the grain when we had to acknowledge that people could acquire a blood group, or something very like one, from the environment

We now know of more than 20 patients who, as a result of disease, usually of the lower intestine, have acquired a B-like antigen on their red cells Table 2 shows the first seven examples to be recognized[7] Their red cells were agglutinated by anti-B sera though they have no *B* in their genotype This is proved by several of them having group O children, so their genotype must be A_1O

This list can now be extended to 23 examples The majority of the patients suffer from carcinoma of the colon or rectum All the patients are group A_1 and the absence of group O from the list is overwhelmingly significant

Since Springer has shown that a coliform organism, *Escherichia coli* O_{86}, contains a polysaccharide very much like human blood group B substance, the present view is that bacterial polysaccharide is passing from the colon into the circulation and hitching onto the red cells There is no evidence yet that Esch coli O_{86} is indeed responsible, and Dr Cameron and his collaborators in Dundee have not yet succeeded in finding it among the intestinal fauna of their patients with acquired B who are still alive

Other interesting non-genetic modifications of blood groups I can only mention in passing natural chimeras with their double set of antigens due to accidental interchange of blood between dissimilar twins in utero, and man-made chimeras, if the interpretation of the extraordinary case recently reported in the *British Medical Journal* is correct A patient with acute marrow failure was given marrow from her sister, not a twin, but, although adult marrow, it "took," with the result that the patient is still, nine months after, producing red cells stamped with her own groups and red cells stamped with her sister's groups

Another curious non-genetic environmental modification is the occasional complete disappearance of the antigen Le^a from the red cells of Le (a+) women during pregnancy After the pregnancy is ended, the antigen returns

TABLE 2 –*Patients With Acquired B-like Antigen on Their Red Cells**

Patient	Age Yr	Yr of Death	ABO Group	Disease	No of Group O Children
1 Dundee	85	1955	A_1	Gangrene of legs	1
2 Albany	87	1956	A_1	Carcinoma of cervix	1
3 Sheffield	86	1956	A_1	Carcinoma of colon	
4 Dundee	77	1958	A_1	Carcinoma of colon	
5 Grimsby	42	alive	A_1	Abscess of appendix cholecystectomy	
6 Dundee	61	alive	A_1	Carcinoma of rectum	1
7 Columbus	68	1958	A_1	Carcinoma of colon	1

* From Cameron Graham Dunsford Sickles Macpherson Cahan Sanger and Race 1959

But the environment, and other genes in the body, seldom interfere with the meticulous handing on from generation to generation of these minute blood group differences From this we can only deduce that it is very important to have blood groups Why it is so important to the body that its red cells should be so elaborately tattooed is still a puzzle

Though a plague to blood transfusion, blood groups have contributed greatly to human genetics and this has been one reward of the great labors of the blood transfusion service

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CLINICAL SCIENCE

Migraine Headache

Its Physiology and Biochemistry

Adrian M Ostfeld, M D, Chicago

Definition—Migraine may be defined as periodic recurrent headache, one-sided in origin, commonly associated with anorexia and nausea, often affecting several members of the same family, and intimately related to cranial vasodilatation Roughly 10% of the United States' population exhibits the syndrome It has been stated that the disorder occurs more frequently in women than in men and affects those who work with their minds rather than muscles However, women, the better educated, and the white collar worker seem more readily to admit to illness and to visit physicians than do men, the poorly educated, and the blue collar worker Therefore, sampling errors in the population studied may have accounted for some of these findings

Physiology—The vasodilatation of migraine occurs primarily in extracranial arteries, arterioles, venules, and possibly veins[1] The arteries usually involved are the superficial temporal, supraorbital, posterior auricular, and occipital Unlike the intracranial vessels, these arteries have a thick muscular coat They supply the skin and subcutaneous tissues of the forehead, scalp, and back of the head, and the musculature of the scalp and forehead The vasodilatation is presumably brought about by one or both of two neural pathways There are cholinergic vasodilator fibers in the facial nerve that supply the facial, superficial temporal, maxillary, lingual, and posterior auricular arteries[2] There are also sympathetic vasodilator neurons that originate in the motor cortex, pass first to the hypothalamus, and then are relayed to the medulla Below this, the vasodilator tract runs to the lateral horns of the spinal cord and onto the perivascular sympathetic plexuses These fibers are cholinergic[3] Sensory innervation of the vessels and surrounding tissues is supplied by the trigeminal nerve and sympathetic fibers that descend in the cervical sympathetic trunks to enter the upper thoracic spinal segments[2]

The work of Tunis[4] suggests that there is a real vasomotor regulatory deficit in persons subject to migraine attacks Even during periods free of headache, the extracranial vessels in migraine patients seem to vary ceaselessly in tone and diameter Thus, while the basic disorder is probably an hereditary or familial defect in local vasomotor regulation, the perception by the cerebral cortex of threatening life occurrences seems to initiate the chain of neurovascular events that results in headache

Extracranial vasodilatation, although a necessary factor, is not sufficient in itself to cause headache In migraine patients, such dilatation may be induced by immersion in water at 108° to 110° F (41 8° to 42 9° C) or by ultraviolet light, and headache does not ensue Many of the local features of the headache attack cannot be explained on the basis of arterial dilatation Among these are local edema, increased sensitivity to noxious stimulation, local tenderness, and, in the eye, chemosis and bulbar conjunctival injection Local features may outlast the arterial dilatation but they never precede it There are, then, at least two pathophysiological events that must occur concomitantly to induce headache They are (1) cranial artery dilatation and (2) local tissue changes of arteriolar dilatation, edema, and tenderness

Biochemistry—The most parsimonious view of the mechanism of the local tissue changes is that there is released into the subcutaneous tissues of the scalp during headache a substance or substances that has the capacity to induce arteriolar dilatation, and, therefore, edema, and to bring about minimal reversible tissue damage The agent may be released locally by nerves It is equally possible that the relevant substance is a blood constituent and accumulates in the local edema fluid entering through more permeable capillaries Once damaged by neurohumoral or humoral agents, local cells could in turn manufacture and release (or both) other noxious agents to maintain the

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From the Department of Preventive Medicine, University of Illinois College of Medicine

process and make the pain of arterial dilatation more intense

Biopsies of superficial temporal arteries obtained during headache involving those arteries show perivascular edema and dilatation of minute vessels There are no necroses, no cellular infiltrations, and no arterial lesions[5] Candidates for the role of the postulated local headache substance should, therefore, possess the following properties (1) natural occurrence in man, (2) the capacity to promote dilatation of arterioles and venules in the relevant vascular beds, and (3) the capacity to induce local tenderness and minimal reversible tissue damage without cellular infiltrate

Because they exhibit these properties, the front running candidates for the role of headache substance are (1) acetylcholine, (2) adenosine triphosphate, (3) bradykinin, (4) histamine, and (5) serotonin Acetylcholine, as the parasympathetic effector substance, merits serious consideration It seems reasonable to suppose that acetylcholine mediates the local vasodilatation and may have a role in the other local tissue effects Kunkle[6] demonstrated an increased acetylcholine level in the cerebrospinal fluid of some migraine patients during headache However, neither headache nor local scalp tenderness can be predictably induced in migraine patients by the subcutaneous administration of 10 to 20 mg of methacholine, a potent acetylcholine congener It is difficult to envision how acetylcholine, destroyed so rapidly in tissue, could maintain a local reaction that persists for as long as several days Thus, while acetylcholine may initiate the local process, it is probably not involved in sustaining it

Adenosine triphosphate is liberated during stimulation of dorsal root fibers Holton[7] has demonstrated increased adenosine triphosphate content in rabbit ear perfusate following antidromic stimulation Beyond this, little is known about the possible relevance of adenosine triphosphate to the migraine attack

Bradykinin, presumably a polypeptide, has been shown to exist in blister fluid and in other inflammatory exudates[8] Fox and Hilton[9] believed that increased activity of the sweat glands was responsible for release of bradykinin-forming enzymes during heat-induced vasodilatation Wolff[10] demonstrated increased bradykinin-like activity in the vasodilated skin of a patient who was unable to sweat because of section of the relevant autonomic nerves Since sweating of the skin of the scalp and face is not a constant occurrence in migraine, and the primary dysfunction in migraine occurs in subcutaneous tissue rather than skin, the question of the dependence of bradykinin formation on increased sweat gland activity is an important one to resolve Agents such as methacholine and adrenalin that dilate the small vessels of muscle and cause sweating do not induce headache or local tenderness in migraine patients The role of bradykinin in migraine is thus not clearly defined at present

Histamine is probably the most widely studied among the candidates for headache substance It is a potent vasodilator, occurs in nerves in relatively large amounts, and is probably involved in the classical vasodilator axon reflex in the skin[11] When injected parenterally in man, it induces a headache which, quite unlike migraine, is felt all over the head, lasts no more than a few minutes, and is accompanied by a red face There is some reason for believing that histamine is not involved in migraine In our patients in double blind studies, orally administered antihistamines in large doses have been no more effective than placebo therapy as prophylaxis against migraine attacks Histamine blockade with diphenhydramine in a dose of 75 mg intravenously and topical tripelennamine (1 800) administered during the prodromal phase of migraine headache repeatedly failed to prevent either headache or the accompanying bulbar conjunctival vasodilatation Moreover, there is no evidence that the histamine in nerves is effective peripherally on target cells or organs[11]

There are several attractive features about the candidacy of serotonin It may, under certain circumstances, be a vasodilator[12] It appears to function as a true neurohumor in some invertebrate species It induces pain in man when given in concentrations as low as 10 —8 mcg per milliliter Some of its effects are antagonized by ergotamine tartrate, the drug of choice in migraine In our laboratory, in a double-blind study, serotonin, in doses of 01 to 02 mg, but not isotonic sodium chloride solution of identical pH and volume, induced low intensity headaches in five migraine patients after injection around the superficial temporal artery and immersion of the patients in warm water of 109° F (42 8° C) Intravenous infusion of serotonin, 0 2 to 2 mg per minute, carried out for 10 to 20 minutes induced headache indistinguishable from their usual head pain in 11 of 25 patients with migraine, as well as its characteristic disagreeable from the usual head pain in 11 of 25 patients such as 1-methyl lysergic acid butanolamide tartrate (UML-491), although ineffective during headache attacks, when taken prophylactically exhibited the capacity to reduce the frequency and severity of migrainous episodes in 14 of 35 refractory patients In general, antiserotonin prophylaxis was successful in those patients in whom serotonin infusion induced headache and unsuccessful in those in whom it did not

Therapeutic Implications

There are two rational methods in attempting to alleviate the migraine attack One lies in the use of vasoconstrictor agents such as ergotamine tartrate This drug causes reduction toward normal size of the dilated arteries and arterioles that make the headache attack painful The principal limitation to the use of ergotamine tartrate had been its propensity to induce nausea and vomiting Attempts to circumvent this side-effect have included the addition to ergotamine tartrate of such agents as belladonna alkaloids, antihistamines, and phenothiazines for antinauseant and antiemetic therapy The combination of antiemetic compounds with ergotamine tartrate has helped to reduce the incidence of this side-effect

Another possible approach to the drug therapy of migraine headache lies in the use of agents that prevent the liberation of, or antagonize the effects of, the headache substance Antiserotonin therapy which has been of limited success prophylactically may open the way for development of more effective drugs of this kind

In view of the probable cortical and hypothalmic participation in the neural process that eventuates as migraine, it is surprising that the so-called tranquilizers have proved of such little value Patients with migraine, who appear to have a great need for activity and accomplishment, are extremely reluctant to "give in" to the sedative effects of these agents

For prevention of migraine headache, the simplest and most effective remedy is still a sympathetic relationship with the patient and a kindly, helpful attitude on the part of the physician A more penetrating relationship can be one in which some attempt is made to have the patient recognize those factors in his life that may be causing him to go in the wrong direction or at the wrong pace Two out of three patients with migraine can be greatly helped by any physician who is interested in human problems and is willing to spend a minimum of time with a patient in reviewing them with him

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CHARCOT'S ARTHROPATHIES —The clinical manifestations of these arthropathies are unique There is a sudden onset of a generalized tumefaction of the limb, rapid changes in the articular surfaces of the joint which manifest themselves as crepitations that are often noticed a few days after the onset, their appearance being evidently determined by the duration of the spinal cord disease, and they usually precede the development of the characteristic motor inco-ordination of tabes These arthropathies develop without apparent cause, they do not result exclusively, as has been claimed, from the distension undergone by the ligaments and capsules of the joints or from the awkward gaits characteristic of ataxic patients, because they are frequently located in the upper extremities or they may involve the shoulder or the elbow Moreover, they can develop in patients who show no signs of motor inco-ordination Anatomically the enormous wear and tear shown by the heads of the bones, the extensive looseness of the ligaments of the joints, and the frequent occurrence of luxations seem to distinguish these arthropathies from the ordinary type of osteoarthritis In a case studied with Joffroy where the arthropathy was in the left shoulder, the anterior horn cells in the cervical region of the spinal cord on the left side were considerably degenerated and deformed Some of the larger cells, particularly the cells situated peripherally, had decreased in size or disappeared without leaving a trace Above and below this point, the gray matter of the anterior horn was unaffected A lesion of the same kind situated a little above the lumbar enlargement of the spinal cord was observed in another case that provided an example of an arthropathy of the knee —G Guillain J-M Charcot, 1825-1893 His Life—His Work, edited and translated by P Bailey, New York, Paul B Hoeber, Inc, 1959

FRACTURE OF THE MONTH—NO. 4

Tibia and Fibula

Otto E Aufranc, M D , Boston

Dr J H Dimon A 64-year-old barber was admitted to the emergency ward on February 7, 1959, after having fallen while drinking There was no history of unconsciousness, and the patient was in generally good health Physical examination was negative except for an obvious closed fracture (both bones) of the distal third of the tibia and fibula of the left leg Circulation and neurological function in the foot were intact The fracture was grossly unstable The skin appeared in good condition After a thorough over-all evaluation of the patient, the skin of the left leg was cleaned with alcohol, and a pillow splint was applied The x-rays revealed a comminuted, oblique fracture at the junction of the middle and distal thirds of the tibia and an oblique fracture of the lower third of the fibula (Fig 1)

Dr O E Aufranc Dr Rowe will open the discussion on the management of this fracture

Discussion of Treatment

Dr D R Rowe This patient had a closed displaced, oblique fracture at the junction of the middle and lower thirds of the left tibia with an incomplete, undisplaced fracture line in the distal tibial fragment extending toward the ankle joint, with a complete fracture of the lower fibula

Our initial concern is the whole patient Immediate urinalysis and hemoglobin determination are indicated

Even though this is an unstable fracture, my initial treatment would be conservative closed management The use of a sling under the knee and an assistant to keep the patella pointing upward are most important, while the surgeon aligns the distal tibial fragment and ankle with the knee Unless the knee is controlled, the common error is a residual internal rotation deformity of the distal tibia and ankle The amount of shortening present is acceptable, but a malalignment of the ankle with the knee is not acceptable A long leg plaster cast should be applied from the toes to the groin, with the knee in 50 degrees of flexion This may be done under light analgesia, or light anesthesia may be used if the patient's condition is satisfactory Before the plaster is applied, the leg should be carefully washed with soap and water and rinsed with alcohol Sterile sheet wadding is then used, thus, if fracture blisters' or a break in the skin occur, the area is clean The leg should then be elevated in slings

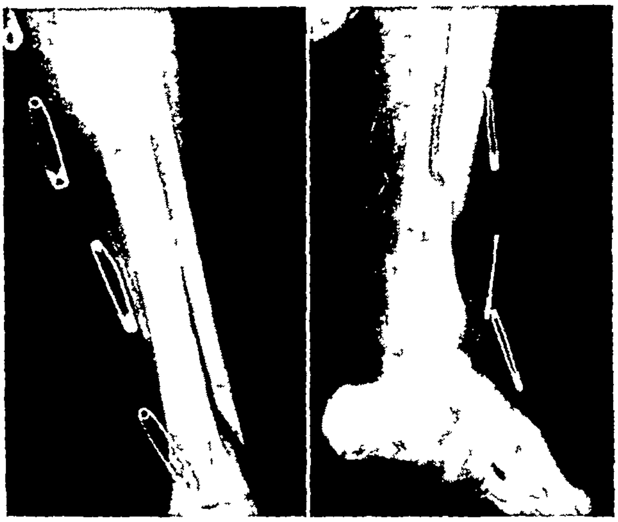

Fig 1 —February, 1959 Initial films of injury Antero posterior and lateral planes, showing slightly comminuted spiral, oblique fracture of distal third of tibia, and comminuted oblique fracture of distal fibula Note pillow splint held in place with safety pins

As pointed out, I would accept reasonable shortening and avoid open reduction, if possible If further shortening and angulation occurred, open reduction should be considered My choice of internal fixation material would be a long six-hole plate applied to the lateral aspect of the tibia The oblique surface of this fracture seems too short for adequate stability from screw fixation alone Intramedullary fixation would have the advantages of earlier mobilization of the patient and a shorter time with plaster fixation Yet, one must consider

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From the Massachusetts General Hospital

the risk of introducing the nail or rod into the distal tibial fragment An undisplaced fracture line extending distally is present, and the rod may complete the fracture line, thus producing a serious complication Surgeons are very prone to overestimate the healing powers of the tibia, and give the patient the impression that his leg will heal in a shorter time than nature is able to accomplish

With conservative closed treatment, which is my first choice, long leg plaster fixation should be maintained until there is roentgenographic evidence of bony union Partial weight bearing in the long leg cast, with slight flexion of the knee, may be started at the 10th or 12th week and gradually increased as union progresses I would not expect healing before five or six months A long leg cast is preferred

If open reduction and internal fixation with a plate of adequate length are used, the duration of plaster immobilization and bony union may be the same as outlined above I do not believe it would be more rapid With the successful introduction of an intramedullary nail, such as the Lottes nail, again, the healing time of the fracture will not be increased, but the use of external fixation may be reduced With a nail which gives stability, the patient should be able to begin partial weight bearing, with crutches and without a cast, in six weeks

Dr O E Aufranc Would Dr DeLorme give his thought on the management of this fracture

Dr T L DeLorme My method of choice in treating this particular fracture would be open reduction I would prefer this method for several reasons 1 Both bones are fractured at approximately the same level, therefore, the fracture is probably unstable 2 If it is unstable, it will tend to slip when the swelling subsides because of the type of fracture—a long, oblique fracture Furthermore, I believe that by open reduction and anatomical fixation the healing time would be markedly reduced As to the type of internal fixation, I would prefer two screws I would think that then healing would occur in approximately 12 weeks, and weight bearing could probably be begun in 4 to 6 months A pin used through the distal tibia would probably enter the fracture hematoma and convert it into an open wound

My second choice in treatment would be an attempted closed reduction If excellent position of the fracture were not maintained, I should open it

Dr O E Aufranc Are there any comments from other members of the staff as to the management of this fracture?

Dr R Mayo I think that this fracture can be handled closed, accepting a little shortening I would have just put the leg in a plaster cast

Dr T L DeLorme I think his total immobilization period would be less if the fracture were fixed with two screws I think he could bear weight on it sooner

Dr J A Reidy I think the fracture would heal faster if screws were used

Dr E F Cave Any operation slows healing

Dr J A Reidy It does not slow healing if the ends of the fracture are not approximated

Resident Would anyone have fixed the fibula?

Dr E F Cave I think I would fix the fibula

Dr O E Aufranc Could we see a show of hands as to how many would treat this without open reduction The majority vote in favor of conservative closed management Dr Dimon, would you tell us how this fracture was actually treated

Treatment

Dr J H Dimon *In the operating room, with the patient under spinal anesthesia, a closed reduction was carried out* Reduction was maintained by placing one pin through the os calcis and one pin through the proximal tibia, these being held in a long leg plaster cast (Fig 2) Postoperatively he was put to bed, and his leg was elevated An anterior window was put in the cast because of the suggestion of tenting of the skin 10 days after reduction (Fig 3) However, the skin was found to be all right He was discharged 20 days after injury, on bed rest, and readmitted at the end of 6 weeks, when the cast was changed and the pins removed A three point, nonweight-bearing gait was started at this time, with the leg in a long leg cast

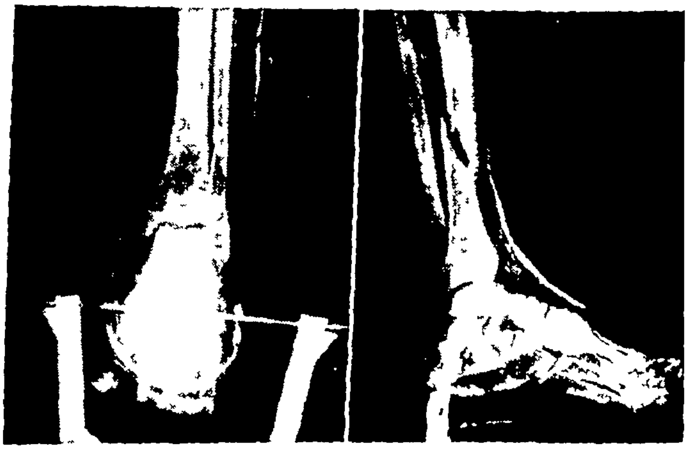


Fig 2 —February, 1959 Films showing closed reduction, with one Steinmann pin through os calcis and held in cast and another Steinmann pin through proximal tibia Traction bow has been used as an aid in manipulation but was removed following application of cast Note some loss of bone contact on lateral view

Dr O E Aufranc Is there further comment?

Dr E F Cave The pins have been removed I think the fracture will unite

Dr T L DeLorme There is practically no bony contact I would not have put in wires or pins

Dr O E Aufranc What is the follow-up?

Follow-up Report

Dr J H Dimon Four months after injury x-ray films taken of the leg without the cast showed good alignment but no callus The patient began crutch walking, with partial weight-bearing, and with the weight of the left leg borne through a long leg plaster cast By 5½ months he started to put 20 to 30 lb of weight on the leg, progressing to about 50% weight bearing 6 to 7 months after the fracture At 11 months (Fig 4), the x-ray films showed very little callus formation, but clinically the fracture felt solid, without heat or swelling He was, therefore, started on weight bearing, which has been gradually increased, without the cast When he was last seen 14 months after injury, the leg was asymptomatic The patient was using crutches, bearing approximately 50% weight on the leg X-ray films showed forming callus (Fig 5)

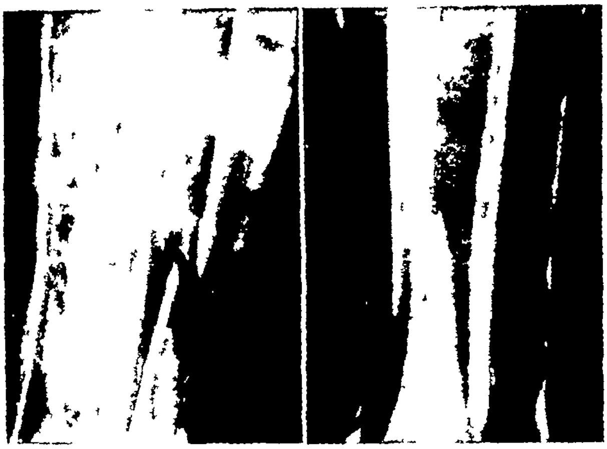


Fig 3 —Anteroposterior and lateral views 10 days after injury Note lack of good contact at fracture site

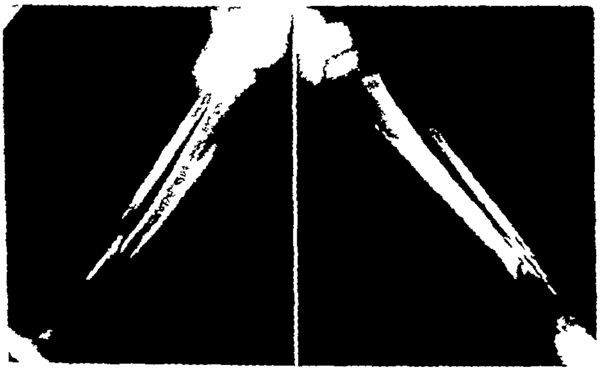
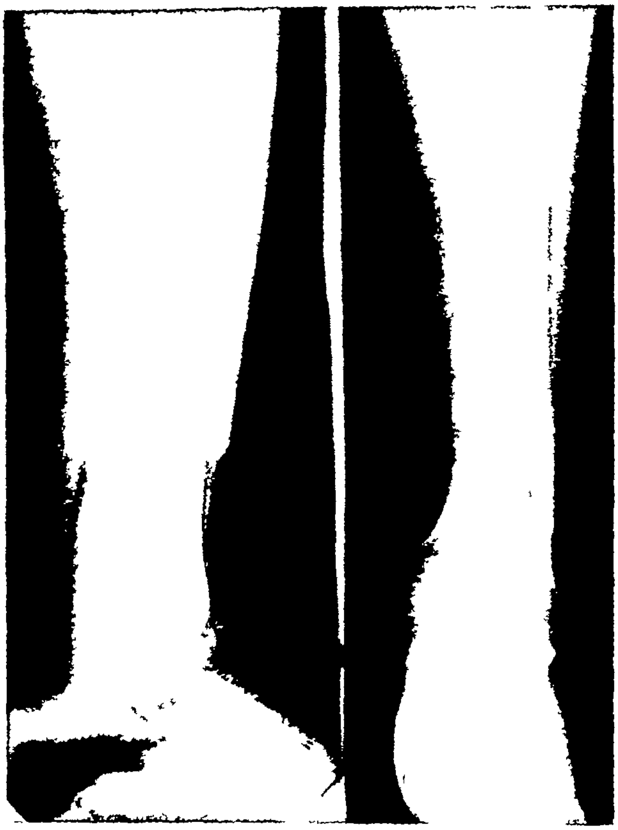


Fig 4 —Anteroposterior and lateral views of fracture site 11 months after injury, at which time patient began weight bearing without cast Note little radiological evidence of bony union although clinically fracture felt united

Summary

Dr O E Aufranc The conservative closed management of a comminuted spiral tibial fracture is ideal

With a loss of position of the fracture after about 2 to 3 weeks, a careful open reduction and internal fixation (probably with plate and screws or screws alone) would be the method of choice, since remanipulation at this time would fail It is difficult to obtain reduction at operation this long after injury The use of an intramedullary nail for holding this kind of fracture should be discouraged The distal tibia has incomplete fracture lines and would not serve as good fixation without the use of restraining bands In addition, there is a chance of further fracture as a nail is advanced Without open operation and without good bony contact, safe and solid healing is delayed Although operations do not accelerate healing of bone, lack of bony contact delays healing to a great extent



Fib 5 —Anteroposterior and lateral views taken 14 months after injury Note some radiological evidence of union

There is evidence that open operations on bone after 2 weeks delays healing less than immediate open operations This is controversial, but I believe that substances in the original hematoma of the fracture favor a more rapid healing Therefore, a delayed open operation may be more favorable The lack of good bony contact was probably the cause of the delayed healing in this fracture

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION

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ONE EDITORIAL YEAR

CALENDAR year, fiscal year, and academic year—all identify specific chronological periods "Editorial year" is a less familiar designation In the reference of this communication, the editorial year began October 26, 1959, with my assumption of responsibilities as Director of the Division of Scientific Publications of The American Medical Association The editorship of the J A M A, one of the largest professional journals in America, and the supervision of the ten specialty journals published by the A M A were paramount among the several Division activities Under the leadership of the Executive Vice-President, Dr F J L Blasingame, these allocations of function followed reorganization of the staff at 535 North Dearborn Street, authorized by the Board of Trustees in August, 1958

The honeymoon for the Director of the Division of Scientific Publications, in keeping with contemporary nuptial honeymoons, was short The satisfaction in the assignment, however, not only persists but increases month by month Surely this is related to the experiences gained during the past twelve months and the appreciation of potential improvement in the mission of the scientific publications and other activities of the Division Most important of all considerations, however, is the realization and full appreciation that freedom of thought and freedom of action for the Director of the Division are inherent in the job

I spent the first days in Chicago in voluntary seclusion in the office Only a few of the staff members were aware that I had reported for duty It was obvious that The Journal had been published weekly for more than seventy-five years and in all likelihood would continue to be published for a while longer without active participation on my part During those initial days, available issues of The Journal from recent months and former years engaged my attention Advantage was taken of those leisurely days to prepare a number of letters to physicians throughout the country, seeking counsel and suggestions for The Journal Fortunately, time permitted the preparation of an extensive, detailed list of proposals How else would one proceed in a new assignment totally unprepared, as judged by previous full-time editorial experience? Many years ago my classmates in high school, as well as in college, had judged me to be so lacking in editorial experience as not to merit election to the staff of either the year books or the school newspapers I had not forgotten those early disappointments and eagerly awaited the challenges that lay ahead

The cover of The Journal received attention first This first assignment was followed by critical scrutiny of each page of editorial material The negotiations associated with the elimination of advertising from the cover and the several steps taken in the evolution to the present format of the cover have already been described in these pages They need not be repeated A limited number of thoughtful criticisms against the design have been voiced The majority of comments, however, have been favorable, several have been flattering Transformation, not transfiguration, appears to have been accomplished

The incorporation of several new sections in The Journal has been apparent to the regular reader The policy in former years embodied the publishing, primarily, of scientific communications that represented experiences well-documented and proved in practice It is obvious in contemporary practice of medicine that clinical observations which seem sound today may be inadequate, even disproved, tomorrow Medicine is changing, and who is to judge which observations will last and which ones will be modified or overthrown It is my belief that such judgment is impossible for any individual or any group of individuals Therefore, I do not consider it improper to publish scientific data in The Journal at an earlier stage of clinical investigation than was the practice formerly Thus, the section entitled Preliminary Communications was started Clinical Science is another new section Manuscripts accepted in this category describe recent advances in the medical field, without the use of complicated charts or graphs, which tend to discourage the reader who is not thoroughly versed in the specific area under consideration This is not science writing for the layman, it is scientific writing for the physician, requiring skill in presentation of data and simplicity of composition This is probably one of the most difficult forms of medical writing Special Contributions usually are unsolicited, in contrast to Special Communications, which frequently are requested Medical Satire, Medical Narration, Summarios in Interlingua, and Fracture of the Month are new sections The News Section is repositioned Medicine at Work and the Leisure Corner have been abandoned Tonics and Sedatives appear infrequently

The Organization Section is the forum for the deliberations of the sixty-five or more Councils and

Committees authorized by the House of Delegates or the Board of Trustees It was my conviction one year ago that many of the reports in this section were too long, too heavily documented, and sometimes presented material that was readily available in current medical literature or in current textbooks It seemed unnecessary to devote precious space to the republication of a discourse from a current textbook A program of selection, condensation, and compression was pursued The Council on Drugs was the first to cooperate Their reports will henceforth provide a digest of the Council's evaluation of new drugs, in contrast to the previous policy of an extensive discussion It is hoped that physicians will read the compressed versions, not pass them by

The signing of Book Reviews and the signing of Answers in the Questions and Answers section is evidence of mental virility among our loyal consultants, without whose efforts these sections would be less productive The signing of book reviews has been practiced for several years by the *Archives of Internal Medicine* under the editorship of Paul S Rhoads The Book Review section of the Archives is one of the strongest departments in that periodical If the *Archives of Internal Medicine* had succeeded in inducing the reviewer to profess responsibility for statements made, why should not we? The answer has been obvious in recent months Cooperation has been more difficult to obtain in the signing of the Answers Success may be reported, however, and in recent issues each Answer, or almost each Answer, has been signed

The Literature Abstracts section has reverted to the format of a decade ago Only a few readers objected to the reversion Most readers who expressed an opinion supported the change The mission of The Journal in the publishing of literature abstracts is unique I believe that the ideal is to publish as many abstracts and tables of contents of other journals as possible and also as currently as is possible The abstracts, as presented in recent months, represent the first stage of transition Several other changes, which I hope will be improvements as well, are under consideration These include briefer abstracts without sacrifice of subject material, the consolidation of Foreign Letters and their incorporation into the Abstracts section, and a modification in layout so that selected abstracts may be removed readily from The Journal and filed for future reference

This statement leads me to a discussion of format and binding Webster defines format as "shape, size, and general style of a publication" During the honeymoon when the term "format" was first mentioned, it drew a blank I have now learned through experience, but particularly through the skillful direction of the Managing Editor, the significance of format Communications should begin at the top of a page and finish at the bottom of a page This is not always possible, but, with particular efforts exerted in this direction, commendable progress may be reported If a few inches remain at the bottom of the concluding page of a communication, a filler is used I have selected the fillers in recent months from general reading Most of them have been chosen from cultural medical literature rather than from scientific publications

The Journal was bound with staples until a few weeks ago, at which time stapling was replaced by a "perfect binding" technique If the issue is bound and not stapled, it should be possible to dismember each issue after it has served its current purpose Original Contributions, Organization Reports, or Abstracts can be removed, without recourse to a scalpel or razor blade, at the risk of a cutaneous laceration, and filed in a loose-leaf binder, letter file, or a card index file I suspect that few physicians bind the current issues of The Journal This function is confined usually to libraries

A discussion of the contributions which follow the masthead—the Editorials—remains Several pages are now devoted to this section The majority are prepared by members of the editorial staff The remainder are prepared outside of the office Some are signed, others are initialed, the majority are unsigned If the Editorial refers to a contribution in the same issue, usually it is unsigned The question of responsibility for editorial statements represented my only serious encounter with the Board of Trustees The Committee on Scientific Activities of the Board of Trustees, under the chairmanship of Hugh H Hussey, listened sympathetically to my plea They recommended to the full Board of Trustees "that it is appropriate for certain editorials that appear in The Journal to carry the Editor, particularly where the Editorial is concerned with some controversial matter on which neither the Board nor the House has taken action"

I have prepared no editorials that have been withheld from publication through any action by an official or staff member of the A M A Publication of a small number has been postponed for reasons which appeared sound to me when they were presented In substance, the responsibility for editorial statements rests with the Editor I do not believe it is possible for a single individual to express A M A policy Such a concept is unrealistic in contemporary medical journalism Expressions of opinion on controversial subjects convey the sentiments of one individual only I hope that this philosophy of editorial narration remains A variety of items has been presented in Editorials Medical history has been discussed—from Egyptian papyri to contemporary medical greats Current, new scientific data have been set forth Other items, such as responsibilities for recruitment of medical students and the duties and privileges of the hospital trustee, are general subjects in medicine which should concern the American physician

I hope that the metamorphosis has not been too fast or too disconcerting to too many readers, for it will continue It is anticipated that it will be less obvious during the next twelve months than it has been during the year just concluded

The reception of the changes has indeed been gratifying No attempt has been made to keep a day-by-day record of the favorable versus unfavorable comments Among the unsolicited comments, I suspect that at least nine are sympathetic for each unsympathetic response I cannot judge whether this is a good or bad percentage No one has objected, however, to the humanizing of THE JOURNAL Just as it is read by individuals with feelings, sentiments, and judgments, so it is prepared by individuals with similar endowments The efforts expended during one editorial year have been responsible for an improved medical periodical

J H T

ACANTHOSIS NIGRICANS

The term acanthosis nigricans[1] refers to the histopathologic changes in the skin which serve to identify this disorder—papillomatosis (wart-like or ridge-like hypertrophy) and (melanin) hyperpigmentation The two types which have been distinguished are of equal incidence but are at opposite poles prognostically The "benign" form is the cutaneous expression of a harmless hereditary disease, whereas the "malignant" form is invariably identified with carcinoma

The skin lesions in either type of "true" acanthosis nigricans are usually symmetrically distributed The areas of predilection include the body folds, particularly the axillas, the intermammary and inframammary areas, the umbilicus, the groin, the inner aspects of the thighs, the genitalia, the intergluteal, perianal, and perineal areas, and the antecubital and popliteal areas The lesions have been observed also on the lids, lips, the neck, the forearms and hands, the hypogastrium, the intervertebral furrow, the mucous membranes of the cheek, the tongue, the epiglottis, the pharynx, and the vaginal mucosa

The color of the lesions varies from yellowish to brownish-red, or black They may assume a blue-gray cast They are localized or diffuse, they may be irregular in distribution and patterned The hypertrophied areas of the skin demonstrate a wide range in configuration, forming papules, nodules, or warts, or ridges with varying width, height, and length Plaque formation may be seen The natural skin markings are exaggerated, and in the benign form, in particular, freckles, pigmented moles, and seborrheic warts are widely dispersed Condylomas may form in intertriginous areas and on mucous membranes The scalp and eyebrows show hair loss Dystrophic changes of the nails and hyperkeratosis of the soles and palms may develop

Benign acanthosis nigricans, a genodermatosis characterized by the development of true nevi at the sites of predilection indicated above, occurs equally in the sexes The lesions appear in infancy, childhood, or puberty, increase in extent, then become arrested Subsequently they may regress, the skin becoming normal in appearance Malignant acanthosis nigricans is associated usually with an adenocarcinoma of the gastrointestinal tract, ovary, lung, or breast Other cellular types (fibrosarcoma of the skin) have been reported

The skin changes may precede the clinical appearance of carcinoma by several years Characteristically, they are widespread and mature when the carcinoma is clinically evident If the carcinoma is extirpated, the lesions regress but may reappear, with recurrence or with growth of metastases The histopathologic changes in acanthosis nigricans include relative and absolute verrucal hyperkeratosis, melanotic pigmentation confined largely to the region of the basal cell layer, and papillomatosis The latter is often regular, digitating with fibrous dermal folds Acanthosis may be absent, slight, or insignificant in degree or may be quite evident, and is often localized The epidermis between the sites of acanthosis may be atrophic—a helpful but not an absolute criterion in differential diagnosis An inconsistent finding is atrophy of sweat glands Occasionally a round cell infiltrate is present, and is usually perivascular

The similarities in the microscopic changes in the two types of acanthosis nigricans, coupled with their similarity in clinical appearance, may constitute serious problems in differentiation This is further compounded inasmuch as the differential diagnosis[2] includes consideration of confluent and reticulated cutaneous papillomatosis, pseudoatrophoderma colli, and pseudoacanthosis nigricans, all of which may also share the changes mentioned These conditions are discussed in this issue of THE JOURNAL, p 1153

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[1] Curth T O Significance of Acanthosis Nigricans, A M A Arch Dermat 66 80-100 (July) 1952

[2] Kesten, B M, and James H D Pseudoatrophoderma Colli Acanthosis Nigricans and Confluent and Reticular Papillomatosis A M A Arch Dermat 75 525-542 (April) 1957

OSTEOGENIC SARCOMA

Among the most common of the sarcomas affecting man are those involving bone, the most characteristic of which is osteogenic sarcoma The term "osteogenic sarcoma" has come to mean to the pathologist a malignant tumor that produces osteoid, at least in some parts The tumor usually arises from bone, but so do myeloma, chondrosarcoma, malignant Ewing's tumor, fibrosarcoma of bone, malignant giant cell tumor, malignant lymphoma (reticulum cell sarcoma) of bone, and other less common malignant tumors The specific characteristic of osteogenic sarcoma is its ability to form osteoid or bone It is radioresistant and has a marked tendency to metastasize early, especially via the blood stream It usually affects persons in the second and third decades of life, although it may strike people of any age

Diagnosis of osteogenic sarcoma, over the years, has depended on two important factors (1) a high index of "suspicion," further substantiated by roentgenographic examination, and (2) biopsy for histologic diagnosis The latter has produced one of the controversial problems facing those who deal with osteogenic sarcoma Can an accurate histologic diagnosis, allowing definitive surgical treatment at the time of biopsy, be based on sections prepared by the freezing technique? Today no doubt exists that almost all osteogenic sarcomas have enough soft portions (the most cellular and active elements) to allow for preparation of fresh frozen sections Some still argue for the fixed-tissue examination, but, with this, the time interval between surgical biopsy and definitive treatment enhances the possibility of metastasis before amputation Accuracy of diagnosis is mandatory and depends upon experience and good microscopic preparations, whether by the rapid or the delayed techniques

An increased rate of survival may be expected in the "one-operation" technique whereby two tourniquets are used, the biopsy being done with one tourniquet above the tumor If the tumor is found to be malignant, another tourniquet is placed higher, and the amputation is performed between the two tourniquets Many tumors send metastatic cells into the general circulation before biopsy can be done, and manipulation of tumors (which would certainly include biopsy) increases this spread of malignant cells

Are there nonsurgical methods of treating osteogenic sarcoma? As indicated, this tumor is radioresistant, in contrast to malignant lymphoma, myeloma, and Ewing's tumor In spite of this radioresistance, physicians must be alert to the possible development of radioactive substances that can be used systemically Possibly, chemotherapy may become of value in malignant disease, but until suppression of bone marrow by these substances can be overcome (perhaps by use of stored and transplanted marrow), this method has severe limitations

What is the chance of survival for the patient after amputation? In this issue of The Journal p 1174, Hayles, Dahlin, and Coventry report a relatively favorable survival rate for children, other investigators have shown similar favorable rates in large series of cases Perhaps the most significant fact discovered relative to survival was in the overall results published from the Mayo Clinic in 1956 It was shown for the first time that the chance of survival of patients with osteogenic sarcoma involving the tibia was twice that of patients with such a tumor involving the femur No clear reason for this was apparent, but the authors speculated on several possibilities

In the meantime, physicians should not be pessimistic and should not be resigned to early death in patients with osteogenic sarcoma, instead, they should realize that, compared with many forms of malignant disease, osteogenic sarcoma carries today a relatively favorable prognosis With earlier diagnosis and expeditious definitive therapy, the salvage may even increase, in time However, osteogenic sarcoma too often remains a fatal disease The ultimate answer to survival in all patients will not be found until the unknown factor or factors in the causation of malignancy are known

MEDICINE ON THE CHEROKEE OUTLET

An editorial entitled "Desert Medicine" in the February 13 issue of The Journal concluded with a plea to physicians to write of frontier medicine either from firsthand experience or from recollections of reliable anecdotes related by trustworthy raconteurs I have no evidence that this admonition has produced any scrivening as of this date There has been published recently, however, a volume of stories on Oklahoma medicine *The Doctor Was Here* by William P Neilson, physician and civic-minded citizen of Enid, Oklahoma Many of us associate this 46th state of the Union with John Steinbeck s Okies, Rodgers and Hammerstein's musical or even the nation's top football team Few are aware of the derivation of the nickname or other features of days when this land was a territory without representation in the United States Congress

Neilson's story begins in 1893, the year of the world s fair in Chicago, with the opening of a vast parcel of land identified as the Cherokee Outlet This was later divided into seven counties It was the last tract of virgin soil, acquired by the government in the Louisiana Purchase, that was given away in large and small plots at high noon on September 16 to each and every one who participated in the land rush, legally or illegally The Osage tribes were thought to be the first Indians in the area They were driven out by the Cherokees, who ruled during the major portion of the 19th century The Cherokees had been evicted half a century earlier from the Great Smoky Mountains of North Carolina, considered to be the native site of their tribe The story of the Cherokees is retold each summer at Cherokee, North Carolina in the drama, 'Unto These Hills' Furthermore anyone who has witnessed the intertribal ceremonials at Gallup, New Mexico, each August will remember that the Cherokees don colorful costumes, which are surpassed only by those of the San Blas Indians from Panama But the derivation of "Sooners" has not been offered The "Sooners were prospective homesteaders who had secreted

ing characteristic of cryoglobulins is their propensity to precipitate when exposed to lowered temperature and to dissolve when warmed to 37° C. Cryoglobulins, according to Farmer *et al*, were found in small amounts in many pathological states such as chronic lymphocytic leukemia, lymphosarcoma, kala-azar, lupus erythematosus, rheumatoid arthritis, periarteritis nodosa, Sjogren's syndrome, subacute bacterial endocarditis, coronary artery disease, polycythemia vera, portal cirrhosis, and malignant tumors.

The major symptom attributed to cryoglobulinemia is a peculiar sensitivity to lowered temperature, referred to as "atypical" Raynaud's phenomenon—atypical because the location and severity are variable and the three typical phases of classical Raynaud's phenomenon may not be present. The involved part in cryoglobulinemia presents a monophasic intense blue color which lasts for several minutes to several hours. This phenomenon is characteristically observed on acral or dependent parts of the body—hands, feet, arms, legs, and especially face, nose, and ear lobes. This state is often associated with petechiae and purpura, and occasionally with ulceration, necrosis, and gangrene. There may be decrease in visual acuity, deafness, dyspnea, stomatitis, melena, and chills and fever after exposure to cold. The ocular fundus often presents dilated retinal veins, hemorrhages, and exudates. The most consistent laboratory abnormalities are anemia, elevated sedimentation rate of erythrocytes, and hyperglobulinemia. A peculiar finding is the "cryoglobulin inclusion cell" which resembles a lupus erythematosus cell.

In cryoglobulinemia the abnormal protein precipitates in smaller vessels on cooling, as a sort of "protein thrombus." This is associated with increased viscosity and stasis of the blood in the involved blood vessels. It is possible that the phenomenon of vascular occlusion and permeability is not limited to the acral areas only, but that it occurs elsewhere in the body because of the wide range of thermal sensitivity of cryoglobulins. Farmer *et al* state that since 1949, when the first case was recognized at the Mayo Clinic, 12 patients with cryoglobulinemia in significant concentrations have been seen at the Clinic. Six of these had multiple myeloma, one lymphocytic lymphosarcoma, and one primary macroglobulinemia. For four, no specific etiologic diagnosis could be established. The symptoms of all these patients were referable to the cryoglobulinemia present. The commonest symptoms were cold sensitivity, oronasal bleeding, and purpura. In seven patients cold sensitivity was noted to involve the hands, feet, and especially the ears and nose. Epistaxis occurred in seven patients. Bleeding from the gums was mild in all instances. Purpura was observed chiefly on the legs, although it also involved hands, face, trunk, and other areas. Painful, recurrent ulcerations associated with purpuric areas on the lower extremities were noted in three instances. Other symptoms included weakness, fatigue, loss of weight, edema, back pain, and fever. In four patients dilated tortuous veins, exudates, and hemorrhages were observed in the ocular fundus.

Laboratory findings in the 12 patients showed hyperglobulinemia in seven cases, the highest level being 10.8 Gm./100 ml. The quantitative test for cryoglobulinemia was performed as follows: All equipment was first warmed to 37° C. Five ml. of blood was drawn and placed in each of two Sanford-Magath hematocrit tubes containing heparin. These were centrifuged at 37° C. for 5 minutes to insure the complete separation of cells and plasma. The total protein, albumin, and globulin were determined in one tube, the other was centrifuged at 2° C. for 30 minutes at 2,500 rpm and the same determinations of protein were made on the contents. The differences represented the cold-precipitable protein. All the patients had cryoglobulin concentrations of 300 mg./100 ml. serum or more, and the highest concentration was 7.2 Gm./100 ml. Six patients had cryoglobulin concentrations of less than 1 Gm./100 ml., ranging from 300 to 980 mg./100 ml. The other six ranged from 1.5 to 7.2 Gm./100 ml. The concentrations of cryoglobulin could not be correlated with clinical symptoms, severity of symptoms, or the nature of the underlying disease process. Most patients had a moderate normochromic normocytic anemia. Albuminuria was present in all six patients with multiple myeloma and three of these six had Bence Jones proteinuria.

The bone marrow picture in cryoglobulinemia associated with multiple myeloma is similar to that usually seen with multiple myeloma. In some cases, many of the myeloma cells have been found to have "vacuolated" cytoplasm, and these cells have been thought to be the source of the abnormal protein. The authors made an attempt to evaluate the degree of vacuolization present not only in the plasma cells but also in the monocytes, histiocytes, and lymphocytes. The most frequently vacuolated cell seen was the monocyte, and relatively few vacuolated plasma or myeloma cells were seen in any of the 12 marrow specimens. In no instance did more than a small percentage of the plasma cells show vacuolated cytoplasm.

In only one patient did cryoglobulin disappear after roentgen therapy, and remission of symptoms has persisted for four years. In the remaining patients, irradiation, alkalating agents, steroids, and anticoagulants gave disappointing results. The amount of cryoglobulin present in the sera could not be correlated with clinical symptoms, bone marrow findings, or the underlying disease.

G. H.

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[1] Farmer, R. G.; Cooper, T.; and Pascuzzi, C. A.: Cryoglobulinemia, *Arch Intern Med* 106:483-495 (Oct.) 1960.

CLINICAL NOTES

Fatal Anaphylactic Shock

Following Intradermal Skin Test with Dilute Horse Serum Tetanus Antitoxin

B Hugh Buff, M D , San Diego, Calif

For more than 35 years, the medical literature has contained numerous publications concerning (1) the prevention of the 50% fatal disease tetanus, by either active or passive immunization, and (2) the dangers and severe reactions resulting from the use of horse serum in the passive type of prevention The following case, however, is the first report of a death occurring as the direct result of an intracutaneous skin test of a dilute dose of tetanus antitoxin obtained from horse serum

Case Report

A 59-year-old man was seen in the office with the complaint of a puncture wound of the right palm, made with a knife, the cleanliness of which was questionable The patient did not know of ever having had an injection of horse serum or tetanus antitoxin previously He had never had toxoid injections, to his knowledge His only allergic history was that he had had hives once following the injection of penicillin Eleven months prior to receiving the wound, he had had a complete physical examination, including electrocardiographic examination The only positive findings at that time were mild osteoarthritis of the right hip, hemorrhoids, and mild obesity His past history was negative The family history revealed that his father had had hay fever

A skin test dose of 0 1 cc horse serum tetanus antitoxin in a 1 10 dilution with isotonic sodium chloride solution was given intradermally In 20 minutes, the test area showed a wheal with red streaks extending up the forearm, and the patient complained of nausea and generalized pruritus A tourniquet was placed on the arm above the site of the skin test, and 0 5 cc of epinephrine was given subcutaneously in the other arm The patient then complained of dizziness and weakness, his eyelids began to swell, and his face flushed It was noted that he had a thready, irregular pulse, and his blood pressure was not obtainable Aqueous epinephrine solution, 0 5 cc, was given intravenously, 50 mg of hydrocortisone was given intravenously, and a lifesaving tube (Chevalier Jackson) was passed into the trachea At this time the patient was unconscious, and the breathing was sonorous Positive pressure oxygen, caffeine, and lobeline were used, but the cyanosis and profuse edema increased Additional epinephrine was given intravenously However, the patient was pronounced dead one hour after administration of the test dose

The accident was reported to the pharmaceutical company which issued the antitoxin, a thorough investigation of this particular lot of antitoxin failed to show any therapeutic irregularities The postmortem examination showed severe laryngeal edema and generalized edema of the body

Comment

Tetanus is a relatively rare disease (At the Mercy Hospital in San Diego, a 335-bed private hospital, an average of only 1 1 cases per year was seen in the years from 1948 to 1958) However, it continues to be a disease of importance because of its severity This experience certainly re-emphasizes the importance of active immunization, not only for allergic persons and those who have been given horse serum previously, but for the entire population Active immunization is the only means of averting the occasional devastating allergic reaction

Several articles have appeared reporting severe anaphylactic reactions following the subcutaneous and intramuscular injection of antitetanus serum Some of these reactions have resulted in death[1] Fatal anaphylaxis following injection of therapeutic doses has been reported by various authorities as occurring in 1 50,000 to 1 200,000 cases[1e] Myocardial infarction has been noted during the serum sickness type of reaction following tetanus antitoxin injection[2]

Reactions following intradermal injection as a skin test, which have been relieved by adrenalin therapy, have been reported[3], and one extensive review of the literature revealed six cases of death due to intradermal administration of various antigens, one of which was undilute horse serum[4] In 1935, Freedman[5] reported the case of a six-year-old boy who developed serum disease 10 days after receiving a dose of diphtheria antitoxin Twenty days later, he was given an intracutaneous dose of 0 05 cc of horse serum, and died in eight minutes, despite the use of adrenalin therapy and artificial respiration

Anaphylactic reactions following tetanus toxoid injection have also been reported in the medical literature [6] Fortunately, sensitivity reactions to tetanus toxoid are very rare Some observers have felt from their experience in large hospital emergency rooms that more and more of the population appears to be becoming hypersensitive to horse serum [7]

The only history noted in this case which might have predicted such an allergic reaction was that of the allergy to penicillin and the family history of hay fever in the father There is much disagreement as to which of several test methods is best for predicting allergy to horse serum Tests include (1) the ophthalmic test, (2) dilute intradermal tests using 1 1,000, 1 100, and 1 10 dilutions of the antiserum, and (3) trial doses Although the second is the method of choice, it is felt from this case that if there is a history of allergy of any kind or a family history of allergy in the case of any given patient, the intradermal test should be given initially with a dilution no stronger than 1 100

Summary

A case is reported of fatal anaphylactic reaction, characterized by pruritus, generalized and laryngeal edema, coma, and death, after an intradermally given skin test of tetanus antitoxin horse serum, using a 1 10 dilution In spite of the use of epinephrine, hydrocortisone, oxygen, and a lifesaving tube, the patient was dead one hour after the skin test was given A brief report of the literature is given, outlining adverse reactions to horse serum previously reported on

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The Lack Of Pulmonary Fibrosis In Patients Receiving Diphenylhydantoin

Niels L Low M D and Melvin D Yahr, M D , New York

A recent report in THE JOURNAL [1] indicated an 87% incidence of 'pulmonary changes roentgenologically in the form of accentuated bronchovascular markings or diffuse pulmonary fibrosis" in 31 patients receiving hydantoins in the form of diphenylhydantoin, methylphenylethylhydantoin, or both The author found an inverse relationship between the presence of gum hypertrophy and these pulmonary changes, and he suggested that his findings were deserving of investigation

Diphenylhydantoin (Dilantin) sodium has been one of the two most effective and widely used anticonvulsants for the control of major seizures for over two decades It is estimated that at least one half of all persons with convulsive disorders (approximately 2 million patients) in this country are taking diphenylhydantoin and would continue to do so for years to come, unless it is hazardous If a significant percentage of patients on hydantoin therapy were likely to develop chronic lung disease, we would have to reconsider the wide use of this medication If, on the other hand, this risk were minimal or absent, the lack of this complication of hydantoin therapy should be emphasized

Material and Methods

One hundred thirteen unselected patients from the Convulsive Disorder and Neurology Clinics of the Columbia-Presbyterian Medical Center who had been taking diphenylhydantoin for from 2 to 22 years were studied by roentgenograms of the chest, with special emphasis on the possible occurrence of abnormally increased pulmonary markings or fibrosis, or both Children and adults were included in the study, and the age distribution is given in table 1 Sixty-five patients were males and 48 were females The duration of therapy varied from 24

From the Department of Neurology Columbia University College of Physicians and Surgeons and the Neurologic Institute Presbyterian Hospital months to 22 years Table 2 shows the distribution of the patients according to the time they had been on diphenylhydantoin therapy Twenty-eight patients were receiving this drug alone, 85 patients, or 75%, were taking other anti-convulsant medications, most commonly phenobarbital, either at the time of the roentgenogram or earlier during the course of the treatment

The individual dosages of diphenylhydantoin varied between 60 and 800 mg from patient to patient in all age groups and varied also at different times in the same patient Nine adults (over 20 years of age) received more than 500 mg daily, and none took less than 300 mg a day, the remaining adults received from 300 to 500 mg The maximum dosage in children and teenagers was 400 mg and only seven received less than 200 mg a day

TABLE 1 —*Age Distribution of Patients Taking Diphenylhydantoin*

Age, Years	Patients No
4 to 10	21
11 to 20	29
21 to 30	9
31 to 40	18
41 to 50	16
51 to 60	13
61 to 72	7
Total	113

Moore[1] suggested that pulmonary fibrosis may occur in the patients who do not have gum hypertrophy, and may be absent in those with marked gingival changes Only 3 of the 113 patients showed a significant degree of gum hypertrophy which required dental referral In the rest it was absent or minimal

Results

Roentgenograms of the chest including anteroposterior and lateral views were taken in all patients None of the 113 subjects showed "diffuse pulmonary fibrosis" or significant accentuated bronchovascular markings In 41 patients comparative roentgenograms taken at the time of starting diphenylhydantoin therapy or shortly thereafter were available for review No relative increase of vascular markings could be seen

TABLE 2 —*Duration of Time Patients Had Received Diphenylhydantoin Therapy*

Duration, Years	Patients No
2 to 3	9
3 to 4	33
4 to 6	30
6 to 8	10
8 to 10	12
Over 10	19
Total	113

Comment

Because we are unable to confirm a risk of pulmonary changes in hydantoin therapy, we recommend that diphenylhydantoin (Dilantin) sodium be used in the future based on the same indications as before and also with the same awareness of signs of overdosage and occasional idiosyncrasy

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We thank the members of the Department of Radiology, College of Physicians and Surgeons and the Presbyterian Hospital for their help All roentgenograms were interpreted by experienced radiologists, and some were read independently by two senior staff members

This investigation was supported, in part, by a grant from the National Epilepsy Society

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Primary Amyloidosis With Jaundice

Richard J Sanders, M D and Charles G Child III, M D, Ann Arbor, Mich

Amyloidosis is a rare disease without known etiology Though microscopically there is no distinction between its various types, clinically amyloidosis may be divided into four groups primary systemic amyloidosis unassociated with other underlying disease, secondary amyloidosis associated with chronic debilitative diseases, amyloidosis associated with multiple myeloma, and localized amyloidosis involving a single area or organ In recent years, the sharp decline in incidence of osteomyelitis and tuberculosis has shifted the interest in amyloidosis from the secondary to the primary form Fewer than 200 cases of primary amyloidosis have been reported, most of them in the past 50 years[1]

The following case of primary systemic amyloidosis was of particular interest because the patient's presenting complaints were jaundice and hemorrhage, unusual symptoms in amyloidosis Because the diagnosis of extrahepatic biliary obstruction could not be excluded, exploratory celiotomy was necessary to establish the diagnosis of primary systemic amyloidosis

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From the Department of Surgery, University of Michigan Medical Center

Report of a Case

A 58-year-old man entered the University of Michigan Medical Center on June 24, 1959, with the chief complaints of rectal bleeding of several days duration, progressive jaundice for nine months, and weight loss of 30 lb (14 kg)

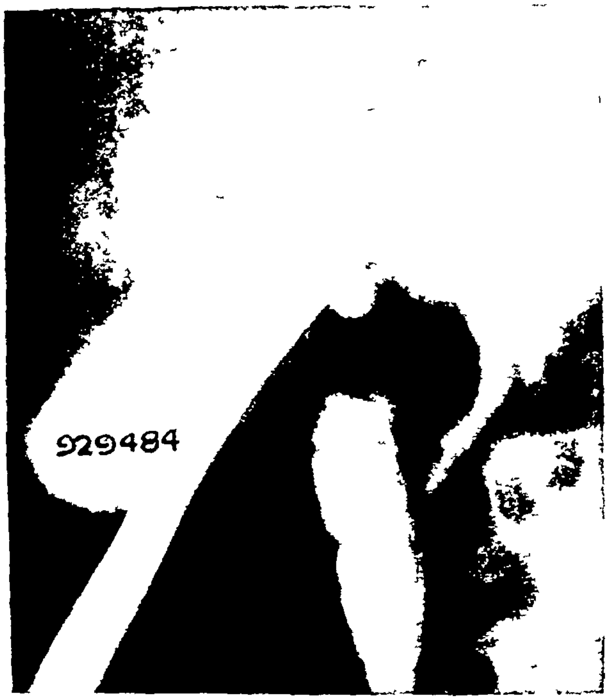

Fig 1 —Operative cholangiogram Common bile duct is not obstructed Dye spills rapidly into duodenum Intrahepatic biliary radicles do not fill well, presumably because of generalized constriction by amyloid deposits

His appetite had been poor for the past several months, and he complained of mild exertional dyspnea and ankle swelling

On physical examination he was a jaundiced, debilitated, chronically ill man His blood pressure was 120/70 mm Hg, his pulse rate was 80 per minute and irregular His heart was enlarged 2 cm to the left of the midclavicular line There was a soft systolic murmur heard along the left sternal border maximum in the third interspace The pulmonic second sound was greater than the aortic second sound, the mitral second sound was greater than the mitral first sound There were bilateral rales in the lung bases and moderate edema of the ankles The liver was not palpable There were large external hemorrhoids and a left inguinal hernia

The hemoglobin value on admission was 10 6 Gm per cent the white blood cell count was 6,700 per cu mm the urinalysis was normal except for the presence of free bile The total serum bilirubin value was 11 6 mg per cent with a one minute direct value of 5 7 mg per cent The thymol turbidity was 0 8 units the total cholesterol value was 113 mg per cent, the total serum protein content was 5 8 mg per cent with 4 0 Gm per cent albumin and 0 8 Gm per cent globulin, or an A/G ratio of 5 0 Repeated serum protein studies were identical The alkaline phosphatase value was 28 8 King-Armstrong units, cephalin flocculation was 2+ in 48 hours the prothrombin time was 22 per cent of normal The serum amylase value was 62 units, the serum lipase value was 0 20 units The blood urea nitrogen value was 17 mg per cent, the fasting blood sugar value was 100 mg per cent The electrocardiographic pattern showed auricular fibrillation

While in the hospital the patient's serum bilirubin value rose to 25 4 mg per cent and the alkaline phosphatase value rose to 50 King-Armstrong units The prothrombin time remained between 22 and 28 per cent despite daily intravenous injections of vitamin K_1 No intrinsic bowel lesion was seen on roentgenograms of the gastrointestinal tract The clinical impression was primary hepatic or pancreatic neoplasm Because of the unclassifiable cardiac findings associated with this picture, the diagnosis of primary amyloidosis was mentioned in the differential diagnosis but was not considered seriously Because an extrahepatic biliary obstruction could not be excluded, abdominal exploration was performed on July 17, 1959 The common bile duct was found to be normal, without evidence of obstruction or distention The abdomen was free of neoplasm The liver was normal in size but of firm consistency and mottled green in color, presumably from bile stasis The liver was biopsied, a cholangiogram and portal venogram were made and the abdomen was closed (Fig 1 and 2) The patient expired 48 hours postoperatively, never fully recovering from the operation At autopsy every organ in the body was found to contain amyloid deposits There was extensive retroperitoneal hemorrhage as well as 450 cc of free blood in the peritoneal cavity Acute ulcers were found in the colon, ileum, jejunum, and esophagus Areas of recent focal hemorrhage were found in the brain, trachea, pancreas, liver, gallbladder, urinary bladder, and heart The final pathological diagnosis was primary systemic amyloidosis

Comment

Classically, primary and secondary amyloidosis can be distinguished by the organs they involve The tongue, heart, gastrointestinal tract, skeletal muscles, skin, and lungs are the usual sites of amyloid deposits in the primary form, while the liver, spleen, kidneys, and adrenal glands are involved in the secondary form There is, however, considerable overlapping of characteristics among these two forms, at least half of the patients with primary amyloidosis exhibit hepatic, splenic, renal, or adrenal involvement

The clinical picture of primary systemic amyloidosis is as varied as the pathological picture Many patterns have been observed cardiac, cutaneous, gastrointestinal, hepatic, and any combination of these The hepatic form is probably the least well known The predominant symptoms of hepatic amyloidosis are marked anorexia and weight loss, simulating anorexia nervosa[2] Hepatic pain and gastrointestinal bleeding are other frequent com-

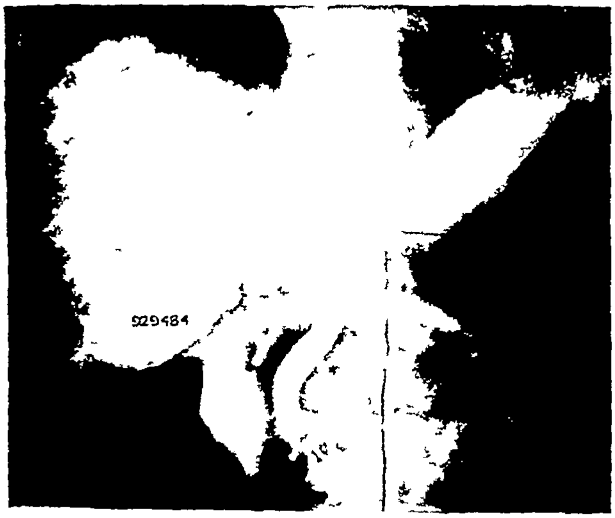

Fig 2 —Normal operative portal venogram

plaints The symptoms are similar to those of a primary hepatoma, and the differential diagnosis between these two may be quite difficult

Laboratory studies are not always helpful in establishing the diagnosis Hyperglobulinemia is a frequent finding, but it is not marked When the globulin content is unusually high, multiple myeloma with amyloidosis should be suspected and the bone marrow studied The only laboratory test that can establish the diagnosis is the Congo red test, and the results of this test are frequently equivocal Peritonoscopy is of help when it reveals a light-colored liver with a rosy-violet tinge[2] A diagnosis of amyloidosis, however, can only be established by microscopic examination of the involved tissues Uncomplicated needle biopsies of the liver have been reported in a few patients with amyloidoses Unfortunately, establishing a diagnosis of primary systemic amyloidosis is an end in itself The prognosis is poor, and, to date, no cures have been achieved, and no treatment is known

A James French, Professor and Chairman, Dept of Pathology, performed the final pathological diagnosis

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The "Nasal Crease"

A Physical Sign of Allergic Rhinitis

W A Myers M D, Honolulu, Hawaii

The term nasal crease, as used here, refers to a persistent transverse hyperpigmented or hypopigmented line extending across the junction of the lower and middle thirds of the bridge of the nose It is always at the site of the natural crease of the skin that is produced when the tip of the nose is pushed upward, as in the "allergic salute"[1-4] ("Allergic salute" refers to the habitual manipulation of the nose, due to chronic obstruction and itching It is typically accomplished by pushing the tip of the nose upward with the palm of the hand) This nasal crease varies from a faint, or temporary, line to the distinct atrophic scars illustrated by our adult patients Several of the faint ones disappeared in a few months after nasal symptoms had been relieved I am not, of course, referring to the temporary blanching of the skin in this area immediately after the "allergic salute" (Fig 1, 2, and 3)

During the past five years, we have collected 116 cases of persons (12 adults and 104 children) who have this nasal crease (see the table) All but two of these patients have either chronic allergic rhinitis or asthma, and these two have a family history of allergy All but seven patients have a history of both the "allergic salute" and typical allergic rhinitis The "allergic salute" was noted by the examining physician in the office, or a reliable history of it was obtained from the children's parents

Allergic rhinitis in Hawaii[2] is usually perennial, therefore, the diagnosis was made from the history, physical examination, reaction to antihistamines or to specific therapy, and, in questionable cases, a nasal smear for eosinophils The majority of the patients have other conditions usually associated with perennial allergic rhinitis, such as chronic nasal obstruction and discharge, other allergic diseases, positive skin tests to inhalants or foods, and

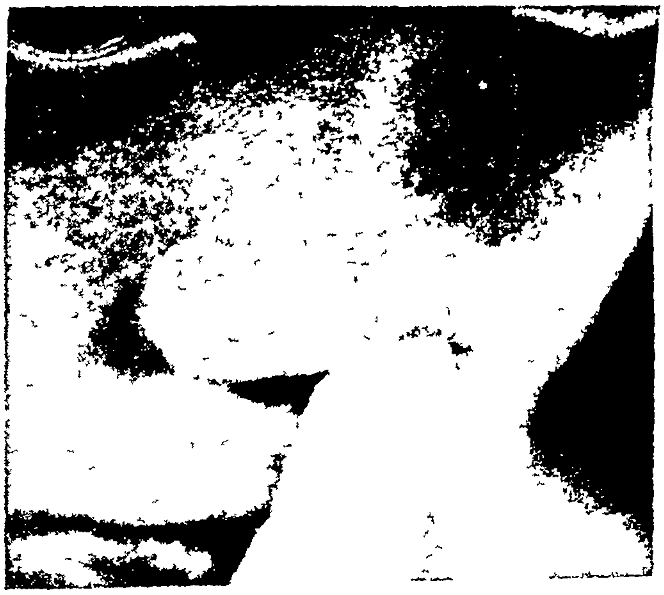

Fig 1 —Nasal crease in patient aged 10 years Perennial allergic rhinitis since age 2 years, "allergic salute" for several years

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From the Department of Pediatrics, Straub Clinic a positive family history of allergic disease Most of them also obtain relief of nasal symptoms with use of one of the antihistamine drugs[3]

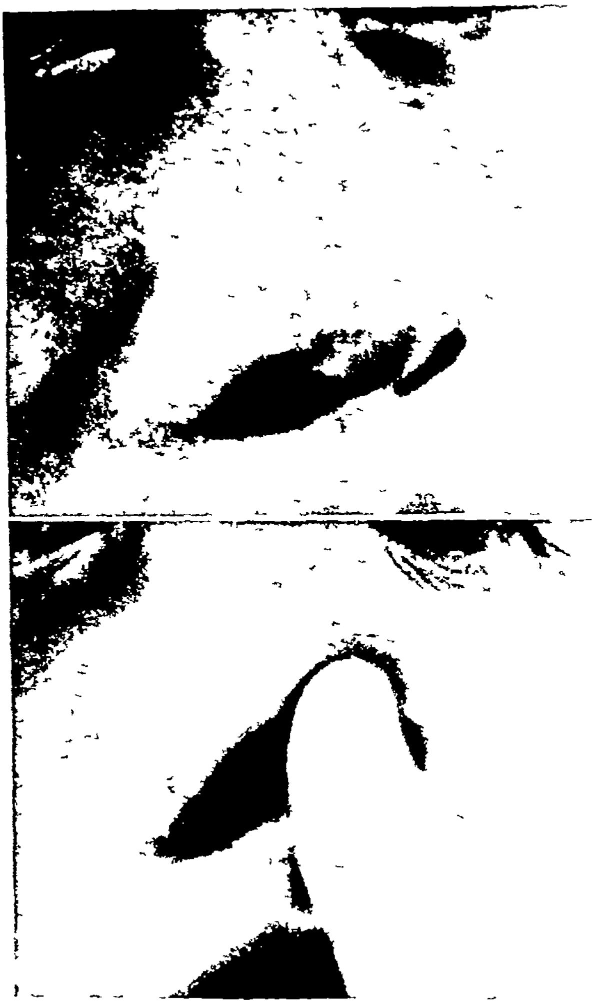

Fig 2 —Patient aged 6 years History of presence of nasal crease since age 1 week (congenital)

The age of the children at the time the crease was first noted by us at the Straub Clinic varied from 3 to 17 years, with a mean of 8 years The history of onset of the chronic nasal symptoms in the children varied from 1 to 12 years of age, with a mean of 3 years Forty-five per cent of the children have been under our care since birth Apparently, the minimum duration of these symptoms that is necessary to produce a noticeable permanent crease is about two years The sex distribution was about equal The race distribution was of interest in that 78 of the patients (69%) were Caucasoid, 24 (21%) Japanese, 10 (9%) of mixed race, 1 Korean, 1 Chinese, 1 Negroid, and 1 Hawaiian The population of Honolulu is approximately 23 per cent Caucasoid, 35 per cent Japanese, 20 per cent mixed races, 10 per cent Filipino, 8 per cent Chinese, and 3 5 per cent Hawaiian (1950 census)

Three of these children do not have a definite history of "allergic salute One has a habit of frequently inserting his fingers in his nostrils and pushing upward This maneuver elevates the tip of his nose in the same manner as occurs in the "allergic salute" He has a positive family history of allergy, but he had no evidence of allergic rhinitis, and no eosinophils were found in nasal smears

Fig 3 —Patient aged 6 years Perennial allergic rhinitis since age 4 years, allergic salute for two years

One other child has no history of 'allergic salute' or any similar habit but has a definite history of the presence of this crease at birth or soon thereafter Incidentally, he has allergic rhinitis but has no family history of allergy

In one other child the "allergic salute' habit had not been noted, but she had allergic rhinitis, asthma, and a positive family history of allergy Only two "nasal crease patients were related (mother and son)

Summary of Data Concerning the Nasal Crease in 116 Cases of Children and Adults

		Patient s Age Yr				History of Allergy					
		When Crease Noted		Onset of Chronic Nasal Symptoms							
	No of Cases	Mean	Extremes	Mean	Extremes	Allergic Salute	Chronic Rhinitis	Family History	Asthma	Other*	Care† Since Birth
Adults	12		22-40		2 22	12	12	10	4	1	1
Children	104	8	3-17	3	1 12	101	100	85	58	50	48
Total	116		3-40			113	112	95	62	51	49

* Other allergies include atopic dermatitis urticaria allergic conjunctivitis but not asthmatic bronchitis All but two patients had either definite diagnosis of allergic rhinitis or asthma and these two had family history of allergy

† Under care of Straub Clinic since birth

Comment

This type of nasal scar is probably due to the repeated trauma of the "allergic salute" or similar habits of several years duration This crease is apparently rarely seen in nonallergic children or ones who do not have, or have not had, allergic rhinitis with its accompanying "salute" I have seen two cases of recurrent slow-healing sunburn of the nose that produced a scar, however, it was not limited to the narrow area described above

To my knowledge, this physical sign associated with the "allergic salute" has not been mentioned in the literature It may be that this crease is more noticeable here in Hawaii, where perennial atopic rhinitis is common and children have a tan all year long This increased pigmentation may accentuate the prominence of the hypopigmented "scar" of the crease In the adult cases this scar is hyperpigmented Making a snap diagnosis on sight, even though minor and incomplete, is worth while if only for the added interest and stimulation that it contributes to daily practice

Summary

The nasal crease, a persistent transverse hyperpigmented or hypopigmented line extending across the junction of the lower and middle thirds of the bridge of the nose occurred in 116 patients (12 adults and 104 children)

All but three of these persons have, or have had, the "allergic salute" habit In one case the crease was apparently congenital One child has a habit similar to the "allergic salute' but no apparent allergy, and the third has allergic rhinitis, asthma, and a family history of allergy

All but two have either a definite history of chronic allergic rhinitis or of asthma, and these two have a family history of allergy This physical sign should, therefore, be considered as presumptive evidence of allergic rhinitis and especially of the "allergic salute" habit of several years' duration

Kapiolani St at Thomas Squ (14)

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New Type of Urinary Calculus Caused by Antacid Therapy

John R Herman, M.D , and Aaron S Goldberg, Sc D , New York City

Any new information bearing on the etiology of urolithiasis is important The composition of calculi has been extensively studied to help clarify the mechanisms of their formation and growth About 99% of all renal stones are constituted by only four substances, viz , calcium oxalate, apatite, triple phosphate, and uric acid To the rare types of stones such as xanthine and cystine, a new type can now be added, a calculus composed of pure silicon dioxide

Report of a Case

On Jan 21, 1959, a 53-year-old physician was seen because of severe renal colic He had had pain for 18 hours, which was not markedly alleviated by 50 mg of meperidine hydrochloride, hot baths, and a heating pad Roentgenograms were taken immediately, and a flat plate of the abdomen showed three questionable shadows of "calcific density" Intravenous urography showed prompt and normal visualization of the right kidney but delayed filling of the left After 20 minutes, a moderately hydronephrotic kidney was visualized, and after one hour the dye could be visualized extending to the lower ureter, where one of the previously noted shadows was seen to be in the intramural ureter The other two shadows were extraurinary

The patient was given 100 mg of meperidine followed by antispasmodics and was asked to force fluids By the next day he was asymptomatic, and n three more days he passed a 2 by 4 mm calculus which corresponded in size and shape to the visualized shadow in the roentgenogram

The patient gave a history of having had two other episodes of colic about eight or nine years earlier but had never recovered a calculus He had a recurrent epigastric pain which had been diagnosed as esophagitis, he readily controlled this by taking a commonly used antacid preparation containing 0 5 Gm of magnesium trisilicate and 0 25 Gm of aluminum hydroxide per tablet His intake of this medicament for the previous two or three years averaged between 30 and 35 tablets a day

Analytical Data

The specimen consisted of a small ovoid calculus of light color and weighing about 8 mg While it

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From the urological service, Bronx Municipal Hospital Center and Albert Einstein College of Medicine, and the chemistry department of the Bronx Hospital could be crushed easily the powder was of an unfamiliar gritty character The material did not appear to dissolve in either dilute hydrochloric acid or sodium hydroxide, and tests of the extracts gave negative results for all the usual components, viz calcium, magnesium, ammonia, oxalate, phosphate and urate

At this point two alternate possibilities were considered the patient was malingering, or he was being treated with some unusual medication (The chemist was not then aware of the silicate containing preparation the patient was taking) A portion of the calculus was heated on platinum foil, and it was clear that the material was almost entirely inorganic and quite refractory, there was no charring melting, or sintering However, a definite and characteristic urniferous odor was elicited At this point it was decided to obtain a roentgen-ray diffraction pattern Dr Brian Mason, of the American Museum of Natural History, performed this examination, which revealed the material to be composed of opaline silica (SiO_2xH_2O) Further confirmation was obtained by a determination of the refractive index

Comment

The finding of a silica concretion in the renal tract is, at first, surprising Silica and silicates are generally thought of as substances entirely foreign to human metabolism Yet the literature shows that silicon is a known, normal metabolite It is absorbed from the gastrointestinal tract, occurs in the blood, and is excreted in the urine to the extent of about 10 mg per day [1] Moreover it has been shown that subjects ingesting 5 Gm of magnesium trisilicate per day excrete about 80 mg of silicon in the urine in the same period roughly 7% of the total [2]

It is of interest to note that since 1936, when hydrated magnesium trisilicate was first suggested for the therapy of peptic ulcer, many silicate-containing drugs have been offered for unlimited sale and have attained wide popularity It was then considered to be an inert drug, with practically no absorption in the human being and no physiological role The present case forcefully illustrates the fact that indiscriminate administration of any drug may be attended by grave consequences The fact that more than two decades have elapsed between the popularization of silicate drugs and the finding of the first human silica calculus cannot be taken as a good index of the rarity of such stones It can be surmised that a proper identification would not be made in the usual cursory examination It remains to be seen what incidence will be found in the future, now that we are alerted to the possibility of silica calculi

Summary

A patient taking large doses of a common silicate-containing medicament was found to have formed a urinary calculus of a new type, consisting of pure silicon-dioxide

111 E 88th St (28) (Dr Herman)

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Transmission of Enteric Pathogens by Barium Enemas

Howard L Steinbach, M.D., Robert Rousseau, M.D., Kenneth R McCormack, M D., and Ernest Jawetz, M.D., Ph.D., San Francisco

After performing barium enemas, we have noted repeatedly the presence of feces in residual barium sulfate The plastic tubing used in preparatory enemas, therefore, was closely observed, and in many cases feces and mucus were seen to pass from the rectum into the tube for varying distances, sometimes all the way into the enema can Since for the next patient only the enema tip was discarded and replaced, it became obvious that we were contaminating some patients with rectal contents from patients previously examined

Radiologists in different parts of the country were queried about their methods of preventing cross-contamination of patients Their replies indicated that in the majority of institutions and private offices the rectal tubes are changed and either washed, discarded, or sterilized More barium sulfate is added to the residue for the examination of the next patient Only occasionally is the barium sulfate discarded and the can and tube washed with soap and water

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From the departments of radiology and microbiology University of California School of Medicine

On observing an enema given with clear liquid and transparent plastic tubing, we saw that the level of fluid fluctuated considerably Deep inspiration, the Valsalva maneuver, coughing, and change of position produce elevations in the height of the fluid, as much as several feet, as a result of fluid from the rectum flowing back into the enema tube Ordinary respiration changes the intrarectal pressure of the undistended rectosigmoid about 1 5 cm (⅝ in) H_2O The pressure in the colon varies from an average basal pressure of 10 4 cm (4 1 in) to 100 cm (39 in) with mass peristaltic movement [1]

During defecation, the intrarectal pressure may rise to a height of 9 ft H_2O, considerably greater than the height of the enema can, which is usually located about 1½ to 3 ft above the table With cramping and spasm of the partially filled colon during an enema, reversal of flow of the fluid and emptying of the colon take place It is a common practice for the fluoroscopist to clamp the tube when spasm is observed, with the intention of reducing flow into the colon Actually, the flow is from the colon to the enema can, and clamping prevents the colon from emptying

Report of Cases

To verify these observations and to determine the frequency of cross-contamination under usual conditions, ten mc of radioactive iodinated albumin was introduced into the rectum of nine patients whose colons had been thoroughly cleansed The barium enema examination was then performed, and at its conclusion, small samples of barium-sulfate suspension were withdrawn from the tube with a needle and syringe about 10 in above the anus and from the top of the column of barium solution remaining in the enema can Radioactivity was detected in the tube samples from five enemas, but none was found in the can samples

Samples of barium-sulfate suspension obtained from the tube and can before and at the completion of barium enemas of four patients were examined for bacteria Some gram-positive rods were found as contaminants in the contents of the can and tube before the enemas were started The can had been scrubbed with a stiff brush and soap solution containing hexachloraphene which was allowed to run through the tube

Gram-positive rods were recovered from the can and tube after each enema Some coliform bacteria were recovered from the tube after one enema and enterococci, probably fecal in origin, were recovered from the tube after another enema These results showed that some gram-positive rods occurred as usual contaminants in either the equipment or contrast medium and that fecal contaminants were evident in tube samples from at least two patients These patients had received a clear liquid diet for 24 hours, 2 oz of castor oil the day before the enema, and an enema with 1,000 cc of a proprietary solution immediately prior to performing the barium enemas (We now routinely give all patients an enema containing 3 Gm of enema solution in 1,000 cc of water This solution has improved the cleansing of the colon considerably) On the roentgenograms of the filled colons no evidence of feces was visible In all probability the contamination would have been greater in less well-prepared patients

Comment

The danger of infection with enteric bacteria (*Shigella* or *Salmonella*), other species of pathogenic bacteria, viruses (such as enteroviruses, hepatitis, and poliomyelitis), protozoa (ameba), or helminths (such as *Ascaris, Taenia, Enterobius,* and vermicularis), by rectal transmission may be greater than by swallowing since the acid normally present in the stomach will kill most types of bacteria or protozoa, unless spores or encysted forms are present The possibility of infection would be enhanced if the surface of the colonic mucosa were ulcerated

Few reports of transmission of enteric disease by rectum have appeared in the literature Hervey [2] reported 13 cases of typhoid fever in which the same apparatus for the Harris drip was used after instillation on an infected patient The tube had been sterilized, but the containers were rinsed only in tap water The incubation period after the enemas varied from three to nine days with an average period of six to seven days, about one-half to one-third the usual incubation period in typhoid contracted orally Gilbert [3] reported contamination of catheters and tubing used for enemas in three patients with paratyphoid fever in one hospital and of enema catheters in another hospital where several cases of bacillary dysentery had occurred

There is no doubt that the danger of contamination and cross-infection exists and that the substitution of enema tips or re-use of non-sterilized enema equipment, even though cleansed with soap and water, is not satisfactory Three possible solutions exist (1) All equipment can be sterilized in an autoclave after each enema This process is expensive and time-consuming and requires a sterilizer of sufficient size to accommodate an enema can (2) A valve can be put in the tube or enema tip to prevent reflux or diffusion of the bacteria when the valve is open and the flow temporarily stopped The valve must be sterilizable or of a cost to warrant disposal An attempt is now being made to fabricate a disposable, inexpensive plastic valve that attaches to a firm disposable enema tip (3) The most practical solution is an inexpensive disposable enema reservoir, tube, and tip

Addendum

Since this manuscript was accepted for publication, similar conclusions have been expressed by another investigator [4]

References

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ECONOMIC RESEARCH DEPARTMENT

Medical Care Costs in an Extended Inflation

A Discussion of the Development of the Voluntary Insurance Mechanism. the Medical Care Price Index. Interrelationship of Price Indexes and Quality Changes. and the Real Cost of Medical Care

Arthur Kemp, Ph D , and Walter R Livingston, Chicago

Those who criticize the voluntary insurance mechanism in payment for health care because of rising costs of medical care prejudice the statement of an issue of considerable significance There is much to be said for the hypothesis that the development of the voluntary insurance mechanism was brought about *because of* rising medical costs, not that the rise in medical costs was *caused by* the system developed Despite such allegations by some critics[1] there is no evidence to support the position that the rise in medical care costs has been caused by the increase in health insurance coverage[2] In fact, it has been pointed out that the average annual rate of increase in surgical fees was substantially greater for the period 1945 to 1950 than from 1950 to 1958, although the extent of health insurance coverage was greater during the latter period[3] Such evidence does not support the so-called insurogenic thesis

Criticism of the rising costs of medical care also begs a more fundamental question, namely, in an extended period of inflation, that is to say, an extended period of rising general price levels, can all prices be expected to rise at precisely the same rate or by the same amount over the same period? The question thus phrased must be answered with an *unequivocal "no"* Furthermore there is no objective measure to determine when any individual price, or group of prices, is too high or too low

In all periods of rising prices for which we have data, some groups of prices have risen more than others There is *nothing to suggest* that any of the prices, or groups of prices, that have risen more than the general price level in the past 20 or 25 years have behaved in a significantly different way from *other particular groups of prices* in previous inflationary periods The available data do indicate, however, that service prices tend to increase more slowly than commodity prices during the primary stages of an inflationary phase and more rapidly than *commodity prices* toward the later stages Both logic and evidence suggest that service prices also fall less rapidly during the initial stages of a deflationary period

Another problem, therefore, in observing the behavior of prices, particularly service prices, is the length of the period under consideration Yet, it is considered by some that a group of prices diverging from the average price of all goods and services is, in and of itself, somehow undesirable The absurdity concealed in this assumption is revealed when one examines the behavior of prices for more than the last few years Indeed, anyone really interested in studying the behavior of prices or of groups of prices relative to the behavior of prices of other goods and services needs to consider a period beyond the last decade When this is done, it becomes evident that several changes have been taking place

Medical Care Price Index

At present, the best yardstick that is available to measure relative changes in medical care prices over a period is the Medical Care Price Index, a component of the Consumer Price Index Obtained by survey and prepared by the *Bureau of Labor*

On observing an enema given with clear liquid and transparent plastic tubing, we saw that the level of fluid fluctuated considerably Deep inspiration, the Valsalva maneuver, coughing, and change of position produce elevations in the height of the fluid, as much as several feet, as a result of fluid from the rectum flowing back into the enema tube Ordinary respiration changes the intrarectal pressure of the undistended rectosigmoid about 1 5 cm (⅝ in) H_2O The pressure in the colon varies from an average basal pressure of 10 4 cm (4 1 in) to 100 cm (39 in) with mass peristaltic movement[1]

During defecation, the intrarectal pressure may rise to a height of 9 ft H_2O, considerably greater than the height of the enema can, which is usually located about 1½ to 3 ft above the table With cramping and spasm of the partially filled colon during an enema, reversal of flow of the fluid and emptying of the colon take place It is a common practice for the fluoroscopist to clamp the tube when spasm is observed, with the intention of reducing flow into the colon Actually, the flow is from the colon to the enema can, and clamping prevents the colon from emptying

Report of Cases

To verify these observations and to determine the frequency of cross-contamination under usual conditions, ten mc of radioactive iodinated albumin was introduced into the rectum of nine patients whose colons had been thoroughly cleansed The barium enema examination was then performed, and at its conclusion, small samples of barium-sulfate suspension were withdrawn from the tube with a needle and syringe about 10 in above the anus and from the top of the column of barium solution remaining in the enema can Radioactivity was detected in the tube samples from five enemas, but none was found in the can samples

Samples of barium-sulfate suspension obtained from the tube and can before and at the completion of barium enemas of four patients were examined for bacteria Some gram-positive rods were found as contaminants in the contents of the can and tube before the enemas were started The can had been scrubbed with a stiff brush and soap solution containing hexachloraphene which was allowed to run through the tube

Gram-positive rods were recovered from the can and tube after each enema Some coliform bacteria were recovered from the tube after one enema and enterococci, probably fecal in origin, were recovered from the tube after another enema These results showed that some gram-positive rods occurred as usual contaminants in either the equipment or contrast medium and that fecal contaminants were evident in tube samples from at least two patients These patients had received a clear liquid diet for 24 hours, 2 oz of castor oil the day before the enema, and an enema with 1,000 cc of a proprietary solution immediately prior to performing the barium enemas (We now routinely give all patients an enema containing 3 Gm of enema solution in 1,000 cc of water This solution has improved the cleansing of the colon considerably) On the roentgenograms of the filled colons no evidence of feces was visible In all probability the contamination would have been greater in less well-prepared patients

Comment

The danger of infection with enteric bacteria (*Shigella* or *Salmonella*), other species of pathogenic bacteria, viruses (such as enteroviruses, hepatitis, and poliomyelitis), protozoa (ameba), or helminths (such as *Ascaris, Taenia, Enterobius,* and vermicularis), by rectal transmission may be greater than by swallowing since the acid normally present in the stomach will kill most types of bacteria or protozoa, unless spores or encysted forms are present The possibility of infection would be enhanced if the surface of the colonic mucosa were ulcerated

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Medical Care Price Index

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Statistics, the index, containing 18 items, undertakes to represent all medical goods and services customarily purchased by urban wage earner and clerical worker families. Therefore, the index has only a limited applicability to those persons, and groups of persons, statistically excluded by its weighting and sampling procedure such as rural families, the aged, and the retired.

Among the items included in the index are physicians' fees with several subdivisions, such as office visit, home visit, obstetric care, appendectomy, and tonsillectomy, dentists' fees, including fillings and extractions, hospital room rates, group hospitalization insurance premiums and, since 1959, surgical insurance premiums, prescriptions and drugs of various kinds and so on. All items with their relative weights constitute the Medical Care Price Index.

One new index, not published before and referred to as "other services," was computed by the Bureau of Labor Statistics at the request of the Economic Research Department, American Medical Association. It excludes medical care service from the "all services" category, thereby making possible for the first time a mutually exclusive comparison of price movements of medical care with that of services other than medical care. Another new index, "medical care less hospital rates and group hospitalization," now published regularly by the Bureau of Labor Statistics, appeared in print for the first time in 1957[4] but is available as far back as 1927.

Few people who write about, or make reference to, "the fees doctors charge" or the "rising cost of medical care" take much time to distinguish the differing behavior among the various components of the Medical Care Price Index. The several components, priced and weighted and grouped into subclasses, behave differently, have behaved differently in the past, and have varied widely in price change over the long inflationary period that has lasted approximately one quarter of a century.

Attacks are made upon the medical profession as a whole, probably because the relative rise in medical care prices since 1952, based on 1947-49 averages, has been greater than the rise in consumer prices in general. To make such attacks indicates only a short-term and cursory glance at consumer prices in general and medical care prices in particular.

The Consumer Price Index: Relative Weights

The Consumer Price Index, sometimes erroneously referred to as the "cost of living index," is composed of over 300 items each of which is weighted according to its relative importance. Weights are based upon the percentage of a city family's annual budget that is spent on a specific quantity of vari-
ns and services. The eight major groups
he Consumer Price Index are food,
rel, transportation, reading and recreation, personal care, medical care, and other goods and services. The medical care portion of the Consumer Price Index, as of December 1958, accounts for 5.4% of the entire index, with housing and food weighted the highest at 32.7 and 28.7% respectively. The major classes of goods and services comprising the Consumer Price Index and their relative importance for selected periods are shown in Table 1.

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(*Shigella* or Sa

Relative Influence of Components

All major groups of the Consumer Price Index have shown large increases in price during the past two decades, ranging from a rise of about 70% for housing to over 150% for food, apparel, transportation, personal care, and medical care recorded rises about midway between the two extremes. Nevertheless, attention has been focused on medical care prices, even though they play a minor role in the entire index relative to other major groups. For example, it would require an increase of 18.5% in the Medical Care Price Index to raise the Consumer Price Index 1%. In contrast, a rise of 1% in the index would result from an advance of only 3.1% in the housing component. Figure 1 shows the relative influence of the major groups by the amount each has contributed to the total rise in the Consumer Price Index since 1939. Food has contributed over 55.0% to the total rise, whereas the categories personal care and other goods and services influenced the rise by 2.3 and 1.8% respectively. The relative influence of medical care has amounted to only 3.2%, or about one-sixth of 1% per year, on the average, since 1939. Even for the decade 1949 to 1959, the relative influence of medical care amounted to only 8.5%, compared to 32.6% for housing and 29.9% for food.

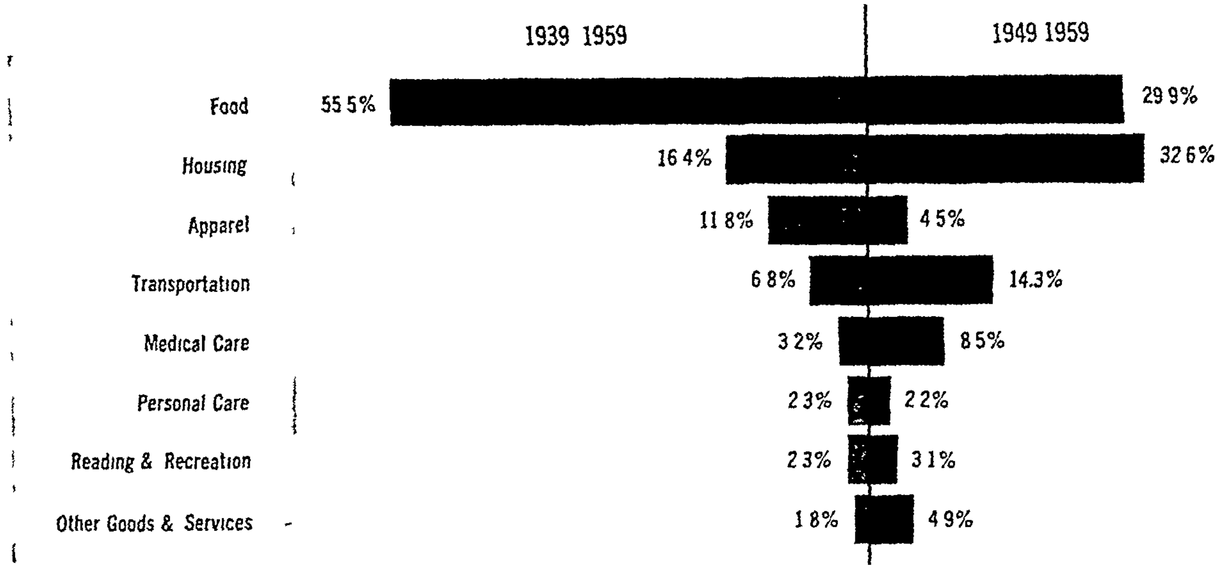
TABLE 1.—Relative Importance of Classes of Goods and Services Comprising the Consumer Price Index for Selected Periods and Dates

Class	1935-39 Average	1947-49 Average	December 1952	December 1957	December 1958
Food	35.1	42.7	29.6	28.6	28.7
Housing	33.7	26.9	32.5	32.9	32.7
Apparel	11.0	12.6	9.2	9.0	8.9
Transportation	8.2	7.1	11.3	11.5	11.7
Medical care	4.0	3.3	5.1	5.3	5.4
Personal care	2.4	2.5	2.0	2.2	2.2
Reading and recreation	2.9	2.8	5.3	5.3	5.3
Other goods and services	2.4	2.1	5.0	5.2	5.1

Source: United States Bureau of Labor Statistics.

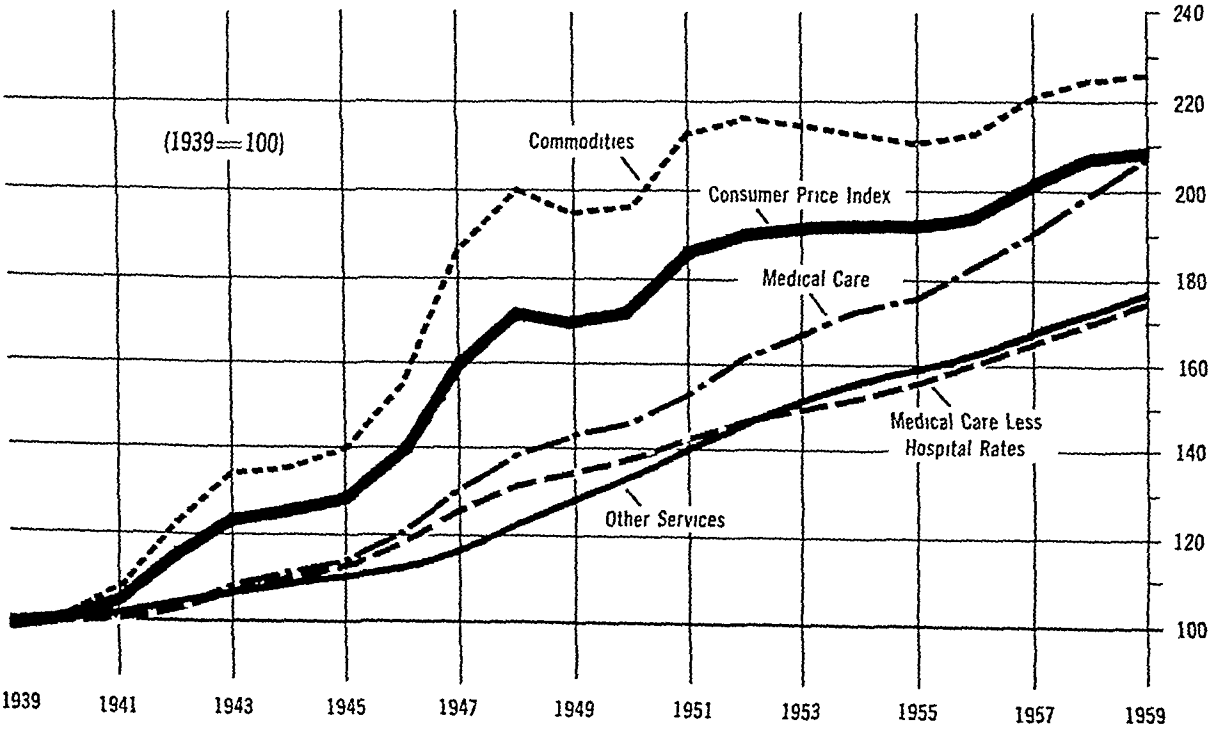
Price Trends

Figure 2 shows the trend of the Medical Care Price Index and other indexes from 1939 to 1959. By 1952, commodity prices had more than doubled, the Consumer Price Index had risen by 91% and 'other services" by 47% Medical care including hospital rates advanced 61%, and medical care less hospital rates rose by 47% The total rise in the Consumer Price Index over the past two decades is greater than the rise in the Medical Care Price Index Commodity prices rose more than medical care prices and increased about two-thirds more than medical care less hospital rates Commodity prices also increased 40% more than did physicians fees



SOURCE Economic Research Department American Medical Association
U S Bureau of Labor Statistics

Fig 1 —Relative influence of major components on rises in Consumer Price Index, 1939 1959 and 1949-1959

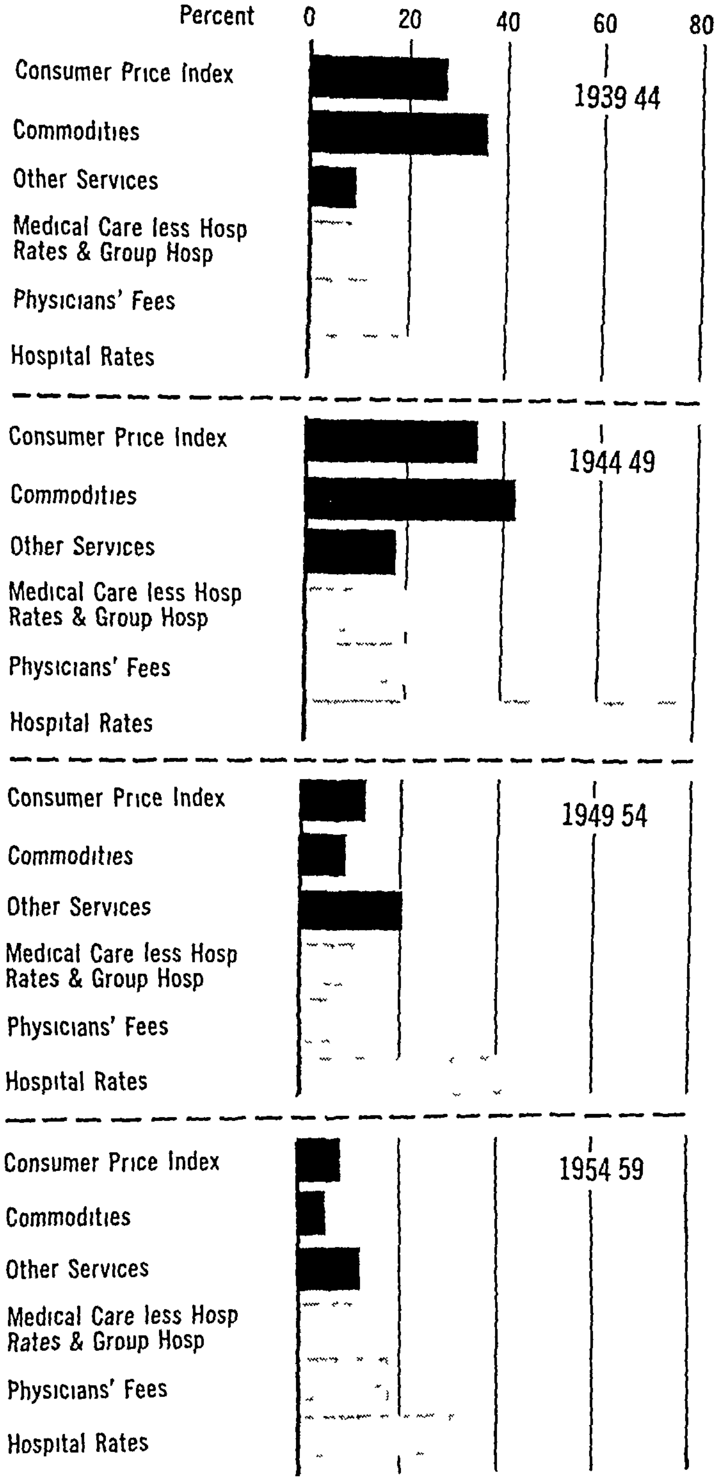


SOURCE Economic Research Department American Medical Association
U S Bureau of Labor Statistics

Fig 2 —Trends in Consumer Price Index and selected components, 1939 to 1959

Price Changes Five-year Intervals

Figure 3 separates the 20-year period into 5-year intervals From 1939 to 1944, when the Consumer Price Index and commodity prices increased 27 and 36% respectively, medical care less hospital rates rose slightly above 10% Physicians' fees were higher by 13% Data for the medical care index, its related items, and other selected items are summarized in Table 2, Column 6 The increase between 1939 and 1944 ranges from 4% for prescriptions and drugs to nearly 25% for hospital rates



SOURCE Economic Research Department, American Medical Association
U S Bureau of Labor Statistics

Fig 3 —Percentage change of Consumer Price Index and selected components by five-year intervals, *1939 to 1959*

From 1944 to 1949 (Table 2, Col 7) the advance in prices in items such as food, men's haircuts, and transportation, overshadowed the over-all rise in the cost of medical care, even though substantial increases in all groups were recorded during this period In 1949, hospital rates were 77% above 1944 levels, prices of prescriptions and drugs had risen by 18%, and physicians' fees were higher by 21% The fees for surgical services performed by physicians varied from an increase of 17% for an appendectomy to 27% for a tonsillectomy

Of special interest is the fact that for almost every item, and for the Consumer Price Index as a whole, the increase in the five-year interval 1939-44 was less than the increase during the five-year interval 1944-49 Judgment of five-year intervals is complicated by the fact that price-fixing during the war period served to understate and suppress the degree of inflation that took place from 1939 to 1944, while the elimination of price-fixing after the war served to overstate the inflation that took place during the period 1944-49 Space does not permit a discussion of the differential effect of suppression of inflation upon the various items of the Consumer Price Index

In the five years from 1949 to 1954 (Table 2, Col 8), the Consumer Price Index and its commodity group rose less than in previous five-year intervals but the costs of "other services" advanced 21% Particularly significant is the equal price increase in "other services" (21%) and the medical care index (20%), medical care less hospital rates rose by only 13% Hospital rates were 42% above 1949, whereas prescription and drug prices had risen about 7% and those in the optometric and eyeglasses group were only 4% above 1949 Price changes of approximately equal magnitude were recorded for physicians' and surgeons' fees, a house and an office visit, tonsillectomy, appendectomy, and medical care less hospital rates

Since 1935 there has been an uninterrupted rise in service prices, with all major components of the service group contributing to the upward movement, the five-year period from 1954 to 1959 is no exception By the close of 1959 (Table 2, Col 9) prices for public transportation and *men's haircuts* advanced a total of 20 and 27% respectively At the same time, medical care prices averaged only 20% higher in 1959 than in 1954, and prices for medical care less hospital rates rose slightly above the 13%

increase for "other services" Significantly, wide variations in price change again occurred among the medical care items The price of hospital insurance premiums rose 42% above 1954 levels, reflecting in part greater coverage, increased utilization, and increased hospital rates, the price of optometric examinations and eyeglasses advanced 9% Hospital rates increased 33% during the period as labor and operating costs continued to mount General practitioners' fees were up 20%, and surgeons' fees rose 9% above 1954 Physicians' and dentists' fees increased 19 and 11% respectively, and prices for prescriptions and drugs went up a total of 11% When price changes for physicians' services since 1954 are compared, their differences range from a rise of 6% for an appendectomy to 24% for a house

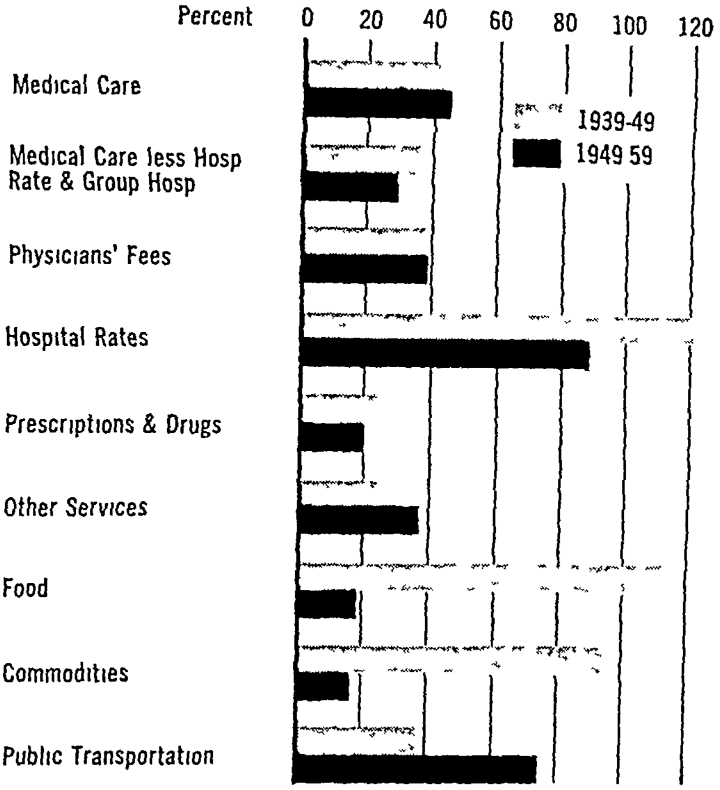
TABLE 2 —Index Numbers and Percentage Change of the Consumer Price Index Medical Care and Other Components by Five , Ten and Twenty Year Intervals (1947-49 = 100)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Percentage Change						
	Index Numbers (1947-49=100)					5-Year Interval				10-Year Interval		20-Yr Interval
Item	1939	1944	1949	1954	1959	1944 1939	1949 1944	1954 1949	1959 1954	1939 1949	1949 1959	1959 1939
						%	%	%	%	%	%	%
Medical care	72.6	81.2	104.1	125.2	150.8	11.8	28.2	20.3	20.4	43.4	44.9	107.7
Medical care less hospital rates and group hospitalization	76.1	84.2	103.2	116.2	132.9	10.6	22.6	12.6	14.4	35.6	28.8	74.6
Physicians fees	74.6	84.7	102.5	119.2	141.6	13.5	21.0	16.3	18.8	37.4	38.1	89.8
General practitioners fees	74.6	84.8	102.5	119.9	144.2	13.7	20.9	17.0	20.3	37.4	40.7	93.3
Office visit	73.8	83.8	102.4	120.4	140.8	13.6	22.2	17.6	16.9	38.8	37.5	90.8
House visit	78.0	86.8	102.3	115.9	143.5	11.3	17.9	13.3	23.8	31.2	40.3	84.0
Obstetric care	67.1	82.0	103.1	131.2	158.3	22.2	25.7	27.3	20.7	53.7	53.5	135.9
Surgeons fees	74.8	84.5	102.9	115.2	125.8	13.0	21.8	12.0	9.2	37.6	22.3	68.2
Appendectomy	76.1	86.9	101.8	114.9	122.3	14.2	17.1	12.9	6.4	33.8	20.1	60.7
Tonsillectomy	73.6	82.1	103.9	116.4	133.2	11.5	26.6	12.0	14.4	41.2	28.2	81.0
Dentists fees	70.1	79.6	104.4	120.9	134.6	13.6	31.2	15.8	11.3	48.9	28.9	92.0
Fillings	70.3	78.7	104.4	120.4	134.1	11.9	32.7	15.3	11.4	48.5	28.4	90.8
Extractions	69.2	78.7	104.6	124.0	137.7	13.7	32.9	18.5	11.0	51.2	31.6	99.0
Optometric examination and eyeglasses	81.9	89.6	103.5	108.0	118.0	9.4	15.5	4.3	9.3	26.4	14.0	44.1
Hospital rates	50.1	62.5	110.4	156.8	208.9	24.8	76.6	42.0	33.2	120.4	89.2	317.0
Men s pay ward	45.3	58.8	111.9	164.4	229.0	29.8	90.3	46.9	39.3	147.0	104.6	405.5
Semiprivate room	51.4	63.7	110.7	153.5	202.8	23.9	73.8	38.7	32.1	115.4	83.2	294.6
Private room	54.1	65.6	108.9	150.9	192.6	21.3	66.0	38.6	27.6	101.3	76.9	256.0
Group hospitalization*				112.5	159.4				41.7			
Prescriptions and drugs	83.5	87.2	102.7	110.1	122.6	4.4	17.8	7.2	11.4	23.0	19.4	46.8
Prescriptions	76.4	81.5	104.2	115.8	133.7	6.7	27.9	11.1	15.5	36.4	28.3	75.0
Aspirin tablets	98.8	99.1	100.3	98.6	109.1	0.3	1.2	1.7‡	10.6	1.5	8.8	10.4
Milk of magnesia	90.0	92.9	100.2	112.3	142.1	3.2	7.9	12.1	26.5	11.3	41.8	57.9
Multiple vitamin concentrate†				100.8	100.5				0.3‡			
Consumer price index	59.4	75.2	101.8	114.8	124.6	26.6	35.4	12.8	8.5	71.4	22.4	109.8
Other items												
Commodities	51.6	70.2	100.6	110.2	116.6	36.0	43.3	9.5	5.8	95.0	15.9	126.0
Other services	81.3	88.8	105.2	127.2	144.0	9.2	18.5	20.9	13.2	29.4	36.9	77.1
Food	47.1	67.4	100.0	112.6	118.3	43.1	48.4	12.6	5.1	112.3	18.3	151.2
Men s haircuts	53.1	75.6	104.9	133.1	169.0	42.4	38.6	26.9	27.0	97.6	61.1	218.3
Domestic service	35.5	78.7	100.8	121.7	141.0	121.7	28.1	20.7	15.9	183.9	39.9	297.2
Household operation	68.4	80.9	100.1	117.4	134.3	18.3	23.7	17.3	14.4	46.3	34.2	96.3
Transportation	70.2	78.2	108.5	128.0	146.3	11.4	38.7	18.0	14.3	54.6	34.8	108.4
Public transportation	81.3	82.3	111.2	161.1	193.9	1.2	35.1	44.9	20.4	36.8	74.4	138.5
Private transportation	65.5	76.2	107.4	119.2	135.2	16.3	40.9	11.0	13.4	64.0	25.9	106.4

Source Economic Research Department American Medical Association U S Bureau of Labor Statistics
* From 1951 1959
† From 1953-1959
‡ Percent Decrease

visit Fees for physicians' office visits and obstetric care advanced 17 and 21% respectively, and a tonsillectomy was higher by 14%

During the last five years the smallest annual increase of 2 2% for the medical care index occurred in 1955, despite a substantial and continuing rise in hospital rates and group hospitalization premiums The smallest annual increase of 3 0% for physicians' fees took place in 1956, and the largest annual increase of 4 3% occurred in 1957 The largest annual increase for any one of the medical care items took place in 1959, with group hospitalization premiums rising 11 2% above the price in 1958



SOURCE Economic Research Department, American Medical Association
U S Bureau of Labor Statistics

Fig 4—Percentage change of selected components of Consumer Price Index by ten-year intervals, 1939-1959

Since 1954, the annual average increase for medical care less hospital rates and for "other services" amounted to 2 7 and 2 5% respectively In contrast hospital rates, on the average, rose 5 9% per year, and group hospitalization premiums on the average were higher by 7 3% per year since 1954

Price Changes Ten-year Intervals

Because 1947-49 averages are used as a base period, the fact that medical care prices advanced more slowly in relation to other prices during the decade preceding 1949 is often overlooked or ignored Figure 4 shows the relative change in price for the two decades 1939-49 and 1949-59 In the earlier decade, food and commodity prices approximately doubled, while physicians' fees, surgeons' fees, and medical care less hospital rates rose about one-third In 1949, medical care prices were two-fifths above 1939 levels The price changes of services performed by physicians varied from an increase of 31% for a house visit to 54% for obstetric care The index range extended from a rise of 23% for prescriptions and drugs to 120% for hospital rates The price change of each item is summarized in Table 2, Column 10

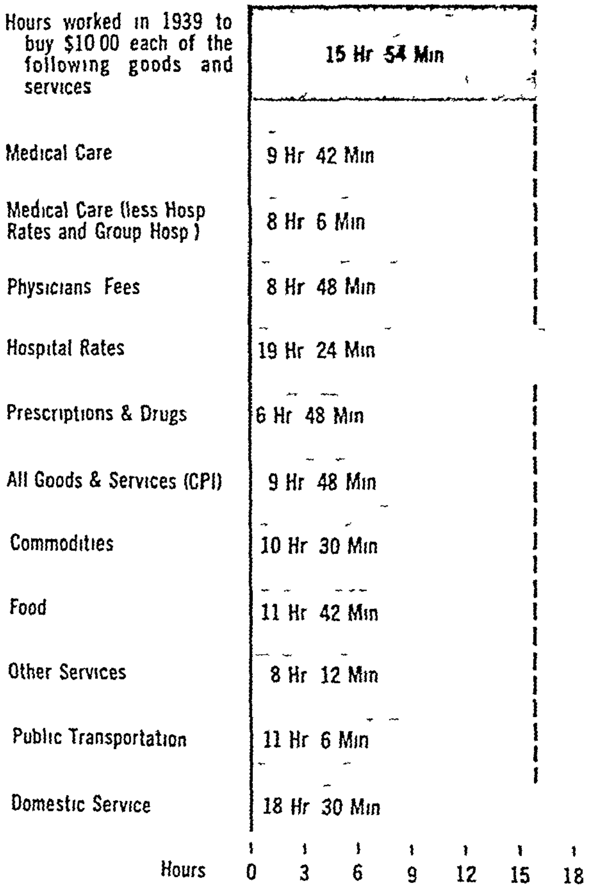
Variations in the price of medical care items in the decade following 1949 were equally widespread By 1959 hospital rates were 89% above 1949 averages, indicating a smaller increase than had occurred in the previous decade A rise of only 14% took place in the optometric and eyeglasses group The price of medical care less hospital rates rose 29% compared with a rise of 37% for "other services," while the fees for services performed by physicians ranged from an increase of about 20% for an appendectomy to over 53% for obstetric care

Price Indexes and Quality Change

Price indexes fail to make due allowance for quality changes This fact is probably more serious in the medical care index than in other components of the Consumer Price Index For example, when looking at price changes in hospital rates, there is, thus far, no way of taking into consideration changes in the cost of the entire service received Although the price per day for hospital rates—which the medical care index measures—has been going up, the average hospital stay as well as the hospital stay for particular diseases has been decreasing A second factor involved is that hospital costs have been altered somewhat, because the sizable volume of labor contributed free on a voluntary basis has changed to paid labor Service rates also have been going up substantially, of course, as have wages in general This is evidenced by a 297% increase in the price of domestic service over the past 20 years—a magnitude comparable to the 317% rise in hospital rates Another factor, frequently overlooked, is the relatively small importance of medical care in the entire Consumer Price Index compared with, for example, food and housing

Real Cost of Medical Care

It would be misleading to draw conclusions regarding the price of medical care by looking solely at costs without also examining changes in money earnings in a period of substantial increases in the price level It is necessary to relate prices to incomes in order to determine the question of price changes in real rather than in money terms In the past 20 years, the rise in weekly earnings for factory workers has more than offset the rise in medical care prices, as well as prices in general Figure 5 illustrates that it required fewer hours of work in 1959 to purchase, even at a higher price, the same quantity of medical care that could be bought for $10 00 in 1939 For example, a factory worker in 1939 had to work nearly 16 hours to pay a $10 00 physician s fee at 1939 prices Today, he works about three-fifths of that time in order to receive the same quantity of service, and this does not take into consideration any increase in the quality of that service He would have had to work 15 hours and 54 minutes in order to buy $10 00 of medical care in 1939, in 1959, for the same amount of medical care, he had to work only 9 hours and 42 minutes despite the increase in prices Examples of this could be multiplied, but in only one case—namely, that of hospital rates—can it be said that the individual factory worker appears to be worse off in 1959 than he was in 1939, in real terms He must now work 19 hours and 24 minutes in order to purchase what 15 hours and 54 minutes of work would have purchased in 1939 It should not be forgotten, however, that this does not allow for either changes in quality or other developments that have occurred since that time In 1939, health services for the most part were financed directly by the employee, since 1939, health insurance, including hospitalization, frequently has been blanketed into a package of employee benefits, and at least a part of the financing of medical care costs is by employers or union funds Thus, this differential does not appear as part of the wages which the individual receives and over which he has control



SOURCE Economic Research Department American Medical Association
U S Bureau of Labor Statistics

Fig 5—Number of hours work required in 1959 by factory workers to buy same quantity of selected goods and services costing $10 00 (or 15 hours, 54 minutes) in 1939

Conclusion

Various categories of prices respond differently to economic changes In general, service prices, being initially less sensitive to upward price movements, do not rise as rapidly as commodity prices in the primary stages of an extended inflationary period As far as the medical care index is concerned, its component parts have behaved differently over the last 20 years The outstanding increases in costs in this area are in hospital rates and group hospitalization premiums They have risen farther and faster than the prices of other items in the medical care index The index for medical care less hospital rates has risen slightly less than the category of other services,' indicating that the advance in medical care prices, other than hospital rates and group hospitalization premiums, has been about the same as that for all other services customarily purchased by a well-defined group of consumers The real cost of medical care has not been rising, indeed, it has been falling over the inflationary period At no time in our history has the average person had as great an ability to pay for medical care as he has at present, and at no time has he been able to buy such an excellent quality of medical care as he can now

What then is the cause of the current emphasis on medical care costs? Undoubtedly it stems less from a desire to determine facts and to interpret them correctly than from a desire to use them to promote particular forms of legislative interference with the price mechanism and with personal income distribution

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3 Garbarino J Price Behavior and Productivity in the Medical Market *Industrial and Labor Relations Review* October, 1959 p 9

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DEATHS

Bailey, Charles Williams, Boca Raton, Fla, Medical College of South Carolina, Charleston, 1921, specialist certified by the American Board of Pediatrics, member of the American Academy of Pediatrics, past-president of the Spartanburg County Medical Society, for many years practiced in Spartanburg, S C, where he was on the staff of the Spartanburg General Hospital, associated with the Arvida Corporation, died Aug 3, aged 63, of acute myocardial infarction

Baird, Thomas Addison, Chicago, Rush Medical College, Chicago, 1925, veteran of World War I, served as house physician for the Sherman and Ambassador hotels, died in the Presbyterian–St Luke's Hospital Aug 17, aged 65, of carcinomatosis and carcinoma of the esophagus

Barns, Frank Milan, Hot Springs, S D, University of Nebraska College of Medicine, Omaha, 1902, died in the Veterans Administration Center Aug 1, aged 83, of acute left coronary occlusion

Bickley, William Ernest, Pendleton, S C, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1916, veteran of World Wars I and II, held the Distinguished Service Cross and the Silver Star, died in Valdosta, Ga, Aug 7, aged 68, of coronary occlusion

Bicknell, Edgar Arnold, Detroit, University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1922, member of the American Academy of General Practice, veteran of World War II, died Aug 1, aged 59

Blanco, Pio, Buffalo, Johns Hopkins University School of Medicine, Baltimore, 1916, served as associate clinical professor of orthopedic surgery at the University of Buffalo School of Medicine, specialist certified by the American Board of Orthopaedic Surgery, certified by the National Board of Medical Examiners, member of the American Academy of Orthopaedic Surgery, fellow of the American College of Surgeons, entered the Mayo Foundation, Rochester, Minn, in 1917 and left in 1922, veteran of World War I, associated with the J N Adam Memorial Hospital, Perrysburg, Millard Fillmore and Columbus hospitals, died Aug 9, aged 69, of myocardial infarction and diabetes

Brawley, Richard Louis, Allentown, Pa, University of Pennsylvania School of Medicine, Philadelphia, 1929, veteran of World War II, died Aug 6, aged 57, of carcinoma of the large intestine

Buist, William E, Nashville, Tenn, Columbia University College of Physicians and Surgeons, New York City, 1894, formerly associated with St Thomas Hospital, died Aug 1, aged 88, of cerebral thrombosis

Burhans, Levi Alden Ⓜ Peoria, Ill, Northwestern University Medical School, Chicago, 1908, veteran of the Spanish-American War and World War I, associated with the Proctor Hospital, died Aug 9, aged 87, of pneumonia and cardiac failure

Cartisser, Joseph James Ⓜ Stanhope, N J, Columbia University College of Physicians and Surgeons, New York City, 1930, past-president of the Hunterton County Medical Society, associated with the Dover (N J) General Hospital, veteran of World War II, a member of the board of education, school medical inspector, died Aug 8, aged 53, of liver insufficiency

Conty, Anthony John Ⓜ Union City, N J, born in New York City in 1889, University and Bellevue Hospital Medical College, New York City, 1913, specialist certified by the American Board of Otolaryngology, fellow of the American Academy of Ophthalmology and Otolaryngology and of the American College of Surgeons, past-president of the Hudson County Medical Society, formerly chief of the eye, ear, nose, and throat department of the North Hudson Hospital and senior attending surgeon, died in the University Hospital, New York City, Aug 1, aged 70, of coronary disease

Crume, John James Ⓜ Amarillo, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1900, specialist certified by the American Board of Otolaryngology, on the staffs of Northwest Texas and St Anthony hospitals, died in the Underwood Hospital Aug 9, aged 92, of generalized arteriosclerosis

Dalton, John Eric, Indianapolis, Indiana University School of Medicine, Indianapolis, 1926, specialist certified by the American Board of Dermatology, member of the American Dermatological Association, of which he was past-president, American Academy of Dermatology and Syphilology, and the Industrial Medical Association, formerly vice-president of the Chicago Dermatological Society, vice-chairman, Section on Dermatology of the American Medical Association, 1950-1951, on the staffs of St Vincent's Hospital and the Marion County General Hospital, died in the Indianapolis General Hospital Aug 5, aged 59, of coronary occlusion due to hypertension and arteriosclerotic heart disease

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Ⓜ Indicates Member of the American Medical Association

Dunlop, William Robertson, Brookline, Pa , Hahnemann Medical College and Hospital of Philadelphia, 1918, examining physician at Westinghouse Electric Corporation and chief resident physician at the Eastern Penitentiary at Philadelphia, died in the Doctors Hospital, Philadelphia, Aug 9, aged 67, of acute myocardial infaction

Fondren, John Thomas, Nashville, Tenn , University of Tennessee College of Medicine, Memphis 1940, retired psychiatrist at Central State Hospital, where he was assistant superintendent, formerly on the staff of the Western State Hospital, died in the Davidson County Hospital July 30, aged 60, of lymphosarcoma of the stomach with metastases to the liver

Garb, John Ⓢ New York City, Long Island College Hospital, Brooklyn, 1921, specialist certified by the American Board of Dermatology, also a graduate in pharmacy, member of the American Academy of Dermatology and Syphilology, associate professor of dermatology at the New York University–Bellevue Medical Center, associated with the Beth Israel Hospital, Manhattan General Hospital and New York Skin and Cancer Hospital, died in the University Hospital Aug 13, aged 70, of cardiac failure

Gray, Harry Palmore Ⓢ Topeka, Kan , University of Kansas School of Medicine, Kansas City, 1936, interned at the Kansas City General Hospital in Kansas City, Mo , veteran of World War I, associated with the Veterans Administration, died Aug 14, aged 63

Hall, George Joyce, Sacramento, Calif , Cooper Medical College, San Francisco, 1912, member of the Endocrine Society, past-president of the Sacramento Society for Medical Improvement, formerly city health officer, on the staffs of the Mercy and Sutter General hospitals, died Aug 4, aged 72, of cerebral thrombosis, cerebral arteriosclerosis, general arteriosclerosis, and benign essential hypertension

Heikes, Richard Eugene, Seattle, University of Kansas School of Medicine, Kansas City, 1957, interned at the Pierce County Hospital in Tacoma, served a residency at the Washington State Department of Health, worked with the Seattle-King County Department of Public Health, in charge of one of the district health offices, accidentally drowned at Rooster Rock State Park in Portland, Ore , July 30, aged 28

Herlong, Everett Eldred, Rock Hill, S C , Medical College of South Carolina, Charleston, 1924, past-president of the South Carolina Urology Association, past member of the board of trustees of Rock Hill School District, and for 15 years team physician for the Rock Hill Bearcats, formerly secretary-treasurer of the Fifth District Medical Society, on the staff of the York County Hospital, where he died Aug 6, aged 64, of carcinomatosis with hemorrhage from axilla

Hindman, Edward Claudius, Howland, Texas (licensed in Texas, under the Act of 1907), served many years on the Delmar School board, the district including the Howland area, on the staff of the Sanitarium of Paris, died July 26, aged 86, of cerebral hemorrhage

Holliday, Morgan Lee, Fillmore, Mo , Kansas City (Mo) College of Medicine and Surgery, 1921, died in the Missouri Methodist Hospital, St Joseph, Aug 8, aged 68, of cardiac dilatation

Korfmacher, Edwin Stanley Ⓢ Grinnell, Iowa, Northwestern University Medical School, Chicago, 1930, fellow of the American College of Surgeons, veteran of World War II, on the staffs of the Community and St Francis hospitals, died in St Mary's Hospital, Rochester, Minn , Aug 4, aged 56, of meningitis and brain abscess

Krichbaum, Carroll Eckle, Terry, Miss , New York Homeopathic Medical College and Flower Hospital, New York City, 1915, veteran of World War II, died in the Veterans Administration Center, Jackson, July 23, aged 70, of exsanguinating hemorrhage, due to leak of arterial anastomosis

Loomis, Roy Robert, Warsaw, Ill , Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1900, on the staffs of the St Joseph Hospital and the Graham Hospital in Keokuk, Iowa, where he died July 28, aged 87, of arteriosclerotic heart disease

Meyer, William Donald Ⓢ Tulsa, Okla , University of Oklahoma School of Medicine, Oklahoma City, 1955, interned at Charity Hospital of Louisiana in New Orleans, resident in pathology at St John's Hospital, served as a captain and flight surgeon in the U S Air Force, died July 31, aged 30, in an airplane crash

Nunez, Juan, Tucson, Ariz , Universidad de Guadalajara Facultad de Ciencias Medicas y Biologicas, Mexico, 1889, died July 27, aged 90, hypostatic pneumonia following hip fracture

Pattis, William Robert Ⓢ Chicago, Medizinische Fakultat der Universitat, Vienna, Austria, 1920, associated with the Woodlawn Hospital, died Aug 10, aged 68, of acute coronary thrombosis

Penhallow, Dunlap Pearce, Philadelphia, N Y , Harvard Medical School, Boston, 1906, fellow of the International College of Surgeons and the American College of Surgeons, formerly village health officer and school physician, veteran of World Wars I and II, formerly associated with the United States Veterans Bureau, on the staff of the Mercy Hospital and the House of the Good Samaritan in Watertown, N Y , died Aug 7, aged 79, of coronary occlusion

FOREIGN LETTERS

BRAZIL

Caudal Anesthesia in Anorectal Surgery —To emphasize the practical importance of caudal anesthesia in anorectal operations, Dr J Vieira Rosa (*Rev Bras Cir* 39 424, 1960) made a study of his first 40 cases He stresses that this old method of anesthesia, now rapidly gaining a prominent place in proctology with the advent of new anesthetic agents, has the advantages of ease of execution, rapid action, prolonged effect, economy of time, equipment, and anesthetic agent, perfect analgesia and complete relaxation of the sphincter, and absence of postanesthetic complications

New Cholecystographic Method —Dr J Moretzsohn de Castro (*Hospital* 58 41, 1960) performed 1,000 successive cholecystograms by means of large doses of iopanoic acid given orally Visualization of the gallbladder and the bile ducts was obtained in 885 The author's technique consisted of previous fluoroscopy of the gallbladder with manual search for areas of tenderness (Lavene's maneuver), a simple roentgenogram of the liver and pancreas under fluoroscopic control, and three series of two roentgenograms each—the first in kinetic rest, the second 30 minutes after the ingestion of the fat meal, and the third 90 minutes later

The first film in each series was made in the upright position and the second in dorsal decubitus Taking the two films almost simultaneously in different positions sheds light on the persistence of the lesions found The study of the three roentgenograms made in the dorsal decubitus position permitted the measurement of the cholecystovertebral angle, and the three made in the upright position with variable pressure over tender areas made possible the precise diagnosis of slight alterations of the mucosae and even the presence of small or radiotranslucent stones

This technique revealed dysplasias and tumors in 16 patients, including adenocarcinomas of the gallbladder in 3, papilloma in 1, cysticovesicular syndrome caused by an abnormal cystic artery in 1, cirrhosis of the cystic duct in 3, and lithiasis and adhesion of the infundibulum with vesicular deformity in 2

FINLAND

Methyl Chloride Poisoning —Technical substitutes for methyl chloride have of late reduced the frequency with which it is used in industry, but leaking refrigerators may still provoke serious poisoning by it Noro and Pettersson (*Nord Med*, July 14, 1960) reported a series of five patients who were so poisoned

The one fatal case, that of a woman of 57, was complicated by renal disease and so presented different clinical findings from those of the other four patients, all of whom had a remarkably similar course Nausea, pain in the abdomen, halitosis, hiccup, diplopia, visual disturbances, clonic convulsions, and mental confusion led to the admission to the hospital where at first food poisoning, possibly botulism, was suspected The patients had not, however, eaten the same food

Suspicion fell on the refrigerator installed in the kitchen of the house in which the patients lived, an examination revealed a leakage of methyl chloride used in it If its use in refrigerators cannot be prohibited, some malodorous chemical should be added to it to serve as a warning of leakage Recovery was slow, and three or four weeks later three of the patients continued to suffer from headache and one of them also from lassitude

SWEDEN

Birth Heights and Weights —Between 1911 and 1957 the average Swede has gained 150 Gm (5 2 oz) in weight at birth and 0 5 cm (0 22 in) in length Engstrom and Falconer (*Svenska lak* [June 3] 1960) reached this conclusion by recording the weights and lengths of 42,282 boys and 39,529 girls at birth during the period from 1956 to 1957, and comparing their findings with those of Dr F J Linders whose study covered the period from 1911 to 1920 and dealt with about the same number of babies

The figures for the period from 1956 to 1957 did not include stillbirths, multiple births, deformed infants, or the offspring of sick mothers In the earlier period it was common for mothers to be confined in their homes, whereas all the figures during the latter period concerned confinements in maternity wards It should also be noted that there has been a great rise in the general standard of living in Sweden in the period under review

Prostatism —Dr V Henrikson (*Svenska lak* [June 10] 1960) advises his colleagues not to routinely refer their patients who have prostatism to a surgeon but rather to study the personal needs and idiosyncrasies of each patient Even a well-educated man may not be aware of his retention of urine and may consult his physician for some other complaint, hence the desirability of keeping the prostate in mind when an elderly man is examined

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The items in these letters are contributed by regular correspondents in the various foreign countries

When retention has been diagnosed, much can be done to relieve it and minimize the frequency of micturition at night by shifting the intake of water to the morning rather than later in the day and by avoiding alcohol and barbiturates at night Increased sexual activity may coincide with abatement of the symptoms of retention Treatment with hormones should be discouraged for fear of promoting malignant disease In spite of this advice, Henrikson confesses to having achieved definite effects with testosterone given to comparatively young men suffering from prostatism Cancer of the prostate cannot be diagnosed with certainty early in the disease, and there is no explanation for the fact that complete urinary retention in some patients is followed by years of complete freedom from it

Surgery for Rheumatic Hands—Since the fall of 1957, Dr M Backdahl (*Nord med* [June 23] 1960) has co operated with the Rheumatological Department of the Karolinska Hospital in Stockholm in operating on the hands of 100 patients whose rheumatism had for the most part 'burnt itself out" He suggested that in the future operative treatment should not be confined to such patients but should be given early enough to prove of prophylactic, not merely palliative or reconstructive, value In many of his patients deformity of the hands had been troublesome chiefly because of the esthetic distress inflicted on their owners Here operative correction could be a great boon

When the wrist in involved, the hand is often secured in a position of volar flexion which entails a functional loss of mobility Ulnar deviation of the fingers is common, and among the many different types of finger lesion is the "swan's neck" finger The usefulness of the hand is much impaired when the stability of the interphalangeal joint of the thumb is interferred with Faulty co-operation of the nerve supply to the hands may interfere with their movements, and to throw further light on this particular problem, electromyographic tests should be made

Barbiturate Poisoning—Dr Gosta von Reis (*Svenska lak* [June 17] 1960) reported a series of 1,164 patients admitted for barbiturate poisoning The death rate from this cause has been greatly reduced by the centralization of these patients in a special hospital department staffed by experts and provided with up-to-date equipment A mortality of up to 30 per cent in some quarters at one time has been brought down to less than 2 per cent

The 19 deaths in this series were investigated, and the causes of 10 were traced to atelectases and bronchopneumonias, 5 to embolism of the pulmonary artery, 2 to heart disease (myocarditis and cardiosclerosis), 1 to nephrosclerosis, and in 1 patient nothing noteworthy was found post mortem In four patients the liver was the seat of advanced fatty disease indicative of alcoholism which had evidently contributed much to the patient's death

UNITED KINGDOM

New Journal—*London Clinic Medical Journal* will be produced from time to time and sent to medical centers and hospitals at home and abroad It will also be circulated to physicians who send their patients to the clinic The magazine is an extension of the activities of the clinic, a non-profit–making institution

Blindness in Babies—In some cases kissing young babies may induce viral conjunctivitis and subsequent blindness, according to an article by Sir Stewart Duke-Elder in the first issue of *London Clinic Medical Journal* The virus that causes herpes simplex is the most frequent infector of the outer eye Children between 6 months and 5 years, of whom only about 10 per cent were found to have protective antibodies, were particularly susceptible to this infection Antibiotics have largely eliminated the serious consequence of bacterial conjunctivitis, but the herpes virus is resistant to all antibiotics This form of treatment could mask the natural bodily response, and the result might be disastrous

Minor Burns—F L Willington (*Brit M J* [July 23] 1960) stated that the treatment of minor burns has always presented a problem in general practice This is shown by the number of treatments which have come and gone, some of these are Carron oil, trinitrophenol, tannic acid, petrolatum gauze, sodium bicarbonate, and cortisone ointment The author recommends a simple remedy which is always available at home, does no harm if the burn turns out to be worse than expected, and provides prompt relief of pain

The affected part should be immersed in milk immediately Immersion should continue until the pain has subsided and there has been a regression of any rudimentary blister This is easy where the hands are involved, but it is difficult to immerse a foot, for instance, in sufficient milk This can be overcome by using the milk as a cold compress, but the results are less reliable and it entails more trouble When the affected part gets greasy from the fat in the milk, it should be gently wiped with absorbent cotton and reimmersed

This is purely a first-aid measure It is suitable only for scalds and burns of first and second degree, not for deep burns or those from electricity or chemicals Success depends on immersion within a few minutes of the accident before any serious blister formation has occurred This should be continued until pain and blisters have subsided in order to achieve use of the part in a few hours without any dressing

QUESTIONS AND ANSWERS

ALLERGY TO TETANUS TOXOID

To the Editor —*A 26-year-old girl receiving her first series of basic tetanus immunization developed an urticarial wheal around the site of injection after the 2nd injection of fluid toxoid The wheal was 4 cm in diameter, red, itching, and slightly raised with a white border It appeared clinically as an allergic response No systemic symptoms were reported There is a history of food allergies in the family, and this patient "breaks out" in hives when she eats strawberries Please advise concerning (1) the advisability of giving the 3rd toxoid injection, (2) methods of preventing a more severe response if it is advisable to give the 3rd injection, and (3) and possible complications which should be guarded against if a booster injection becomes necessary after trauma Would another type of toxoid preparation be preferable to complete the immunization?*

M D, Maryland

Answer —Allergic reactions to tetanus toxoid are rarely reported in the literature When they occur they are generally mild and have been related to protein elements in the inoculum, traceable to the growth medium from which the toxoid is prepared At present, all toxoid preparations are purified to minimize the introduction of such protein traces

Should an allergic response be noted, however, it is advised that the next inoculations of toxoid be a different preparation In administration of this dose it would be preferable to give a reduced volume (0 1 ml) followed in one hour, if no allergic response occurs, by the remainder of the dose Should the patient again have an allergic response, 0 5 cc of 1 1,000 aqueous solution of epinephrine may be used to control the reaction Completion of the full dose may then be accomplished, by means of a series of reduced doses spaced as above, with prophylactic administration of antihistaminics as required

Booster doses of toxoid should then be administered every five years and after trauma In each instance, the physician should know of the prior history of allergic response, and epinephrine and a tourniquet should be readily available Failure thus to protect the allergic patient with tetanus toxoid at a time of injury needlessly subjects him to a serious hazard

E Russell Alexander, M D

DOCTORS OF MEDICINE AND OSTEOPATHS

To the Editor —*Would you please advise me with regard to the ethical and professional relationships between doctors of medicine and osteopaths I am particularly interested in those surgical cases where doctors of medicine have osteopaths as assistants or anesthetists, and vice versa It is my present understanding that it is ethical for a doctor of medicine to accept a referral from an osteopath and to have him assist at operation and in the postoperative care, provided the doctor of medicine has full responsibility in the case and sends a separate bill*

Ralph V Harr, M D, Santa Rosa, Calif

Answer —The policy of the American Medical Association is that all voluntary professional associations between doctors of medicine and osteopaths are unethical It is considered unethical for a doctor of medicine to have an osteopath assist him at operation or in postoperative care or to act as his assistant or anesthetist

RETICULOSE

To the Editor —*A recent clinical symposium on viral diseases featured reticulose Is it of any value?*

Emanuel J Wexler, Chicago, Ill

Answer —Reticulose is an intramuscularly administered "lipoprotein nucleic acid complex" which has been claimed to be "valuable in the treatment of influenza, poliomyelitis, viral hepatitis, mumps, measles, and the unclassified viral upper respiratory infections" It has not been evaluated by the A M A Council on Drugs, and, despite the fact that it has been marketed for more than 20 years, we are unaware of the existence of any scientific evidence which adequately establishes its therapeutic value

Although in a study by Thompson (*Milit Surg* 110 51, 1952) reticulose was reported to be "effective in the treatment of radiation injury," a later report by Smith, Ruth, and Canter, of the National Institutes of Health (*Proc Soc Exp Biol Med* 81 116, 1952) is concluded with the following statements "Reticulose given by subcutaneous injection to mice, with and without streptomycin treatment, failed to alter mortality, leukocyte count, or incidence of blood stream infection after 625 r whole body x-irradiation Given to rats it failed to alter mortality after 570 r whole-body x-irradiation"

Christian Wingard, M D

The answers here published have been prepared by competent authorities They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply Anonymous communications cannot be answered Every letter must contain the writer's name and address, but these will be omitted on request

PREMENSTRUAL FEVER

To the Editor.—*A 45-year-old woman has been having bouts of fever reaching 104.0° or 105.0° F (40.0° to 40.6° C.) with chills, two or three days preceding menstruation, for the past two years. Such episodes never occur during the interval. The patient recovers in 12 to 24 hours when antibiotics are administered orally and intramuscularly. Is there any connection between the onset of menstruation and such febrile attacks?*

William Nussbaum, M.D.
Kew Gardens, L. I., N. Y.

Answer.—To the best of my knowledge there is no connection between the premenstrual period or the onset of menstruation and such febrile attacks.

Ronald R. Greene, M.D.

PSYCHOGENIC FEVER

To the Editor.—*In my psychiatric practice an occasional patient has been referred to me with a low-grade fever as one of the principal symptoms. There seems to be a difference of opinion whether fever can arise from emotional causes. My personal experience among hospitalized patients, who would seem to have the more serious disorders, is that a fever represents an organic condition, usually infectious or inflammatory. In some patients it might be years before the cause is defined clearly enough to be recognized, but I have always thought of organic disease rather than a functional cause in connection with fever. I wish to exclude overactive patients who, I know, may have a slight fever. Is there any evidence that emotional states can cause fever?*

Roland D. Roecker, M.D., Summit, N. J.

Answer.—There are reports in the literature of hysterical fever with a marked elevation of temperature, but their authenticity has raised doubts among noted neurologists. Occasionally, patients have been discovered rubbing the thermometer or placing it in contact with a hot water bottle. Moderate elevations in temperature associated with emotional stimuli in neurotic patients have been demonstrated many times by competent clinicians. Deutsch and Horder reported a case of psychogenic fever of 15 months' duration. The diagnosis was made by exclusion of organic disease and by experimental production of fever by emotional stimuli.

There are several reports in the literature of the production of a temperature elevation by means of hypnotic suggestion and, similarly, a return to a normal temperature by a countersuggestion. A rise in temperature has also been caused experimentally by fright (e. g., a suggestion to a neurotic patient that she needs an operation). The rise in temperature is usually within 1.0 to 1.5 degrees.

Clinicians accept the association of emotions with increased secretion of epinephrine or changes in the mobilization of blood sugar but resist the concept of emotional association with heat regulation, because fever is a symptom of organic disease. One readily accepts blushing or pallor as being caused by emotional changes and does not question the associated dilatation or constriction of the capillaries in the skin. Similarly, emotions may be associated in susceptible persons with vasomotor changes that interfere with heat elimination or cause increased heat production.

When speaking of mental states influencing bodily changes, it is more proper to use the words "associated with" rather than "caused by," because mental events can only precede, or cause, other mental events but are associated with corresponding physical changes, the emotional state and the increased temperature being two aspects of the total organism.

Isadore Finkelman, M.D.

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PARAFFIN PAPER MILK CARTONS

To the Editor.—*Is the ingestion of milk from wax-coated paper containers associated with a risk of cancer?*

Jerald M. Spivak, M.D., East Paterson, N. J.

Answer.—The Food and Drug Administration has, since the advent of the new Food Additives Amendment, taken a careful look at the wax used to coat the paper used for bottling milk and other products for human consumption, and in all cases have eliminated any varieties that might be questionable. Tests in small animals have shown that some carcinogens are found in waxes similar to those used in the preparation of milk cartons, but there is no evidence that the approved coating materials are carcinogenic, and the rigid control of such products by the Food and Drug Administration would preclude the addition of any known carcinogenic hydrocarbon in such containers. The amount of wax which will be found in milk stored in wax-coated containers would, in any case, be infinitesimal, and it is doubtful that any adverse effect would occur.

Ogden C. Johnson, Ph.D.

INSOMNIA, SLEEP, AND DREAMS

To the Editor —*In* The Journal, *July 2, page 1048, a British correspondent asked for the American classification of the four types of insomnia An article in the* New England Journal of Medicine *(255 55, 1956) describes four types of insomnia In brief, type 1 includes patients who develop tension during the day to such a degree that they are unable to relax enough at bedtime to go to sleep within an hour or two, type 2 consists of those who become so fatigued during the day that they sink into a deep sleep at bedtime only to awaken earlier and earlier in the morning, then cannot go back to sleep, type 3 includes those who fall asleep readily when they retire but keep awaking every hour or two during the night, and type 4 is made up of those who honestly believe they have had no sleep in weeks or months because they are continuously aware of everything that happens throughout the night*

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LOSS OF TASTE

To the Editor —*Regarding the answer to the question on loss of taste (*The Journal *173 742 [June 11]) the most probable diagnosis for this patient is little strokes due to thrombotic processes in atheromatous cerebral vessels The accumulation of symptoms suggests a course sufficiently progressive to justify anticoagulant therapy, if laboratory control is available This diagnosis is the more probable if several symptoms have occurred abruptly and if such minor psychiatric symptoms as difficulty in concentration, loss of memory for recent events, and some loss of previous interests are present*

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Malines, Belgium

The above comment was referred to the consultant who answered the original question, and his reply follows —Ed

To the Editor —*I agree that cerebral arteriosclerosis may account for all the symptoms, but it seems necessary to rule out the possibility of a localized intracranial lesion before beginning treatment with anticoagulants The accompanying psychiatric symptoms which were mentioned would be discovered in the course of a complete examination*

Leonard E Himler, M D

ALLERGENIC SUBSTANCES FROM INSECTS

To the Editor —*In* The Journal, *June 4, page 609, the following question was asked "What is butterfly fever and where is it found?" The answer was concerned with allergic substances from insects It is my impression that the question pertained to systemic lupus erythematosus Several years ago some medical papers and several lay journals termed this disease "butterfly fever" I remember distinctly that such a term appeared in the St Louis daily newspapers on several occasions Lupus erythematosus acquired this synonym because of the configuration of the lesions on the face I have not observed the term in recent years but believe this is the disease to which the questioner referred*

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The above comment was referred to the consultant who answered the original question, and his reply follows —Ed

To the Editor —*The physician who makes reference to the St Louis daily newspapers quite understandably brings to our attention the fact that the term "butterfly" frequently has been used to characterize the anatomic distribution of the skin lesions associated with systemic lupus erythematosus, but, although the phrase "butterfly rash" is well documented, this cannot be said for the term "butterfly fever" Talbott and Ferrandis in their monograph on collagen diseases (New York Grune & Stratton, Inc, 1956) list "butterfly rash" six times in the index but make no reference to "butterfly fever," although "fever" is also listed six times in the index*

It was our considered opinion (for we ourselves initially wondered whether the inquiry related to lupus erythematosus), based on the wording of the question, especially the wish to know where it is found, that the condition about which the question was raised was one which was not too well documented and which, like hay fever, might be subject to geographical variations Lupus erythematosus would not qualify according to these criteria, but inhalant allergy to insects might As we pointed out in our original answer, the information contained therein was predicated on the assumption that inquiry was being made about an allergic condition The physician who posed the original question will be in a position to assess both Dr Lane's and our comments, inasmuch as he indicated knowing a person who has "butterfly fever"

ABSTRACTS FROM THE LITERATURE

Archives of Ophthalmology

64 482-615 (Oct) 1960

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M F McCaslin p 482
*Significance of Diurnal Tension Variations in Normal and Glaucomatous Eyes—S M Drance p 494
*Glare and Age
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*Reversal of Retinopathy in Waldenström s Macroglobulinemia by Plasmapheresis—P J Schwab and others p 515
*Fluctuations in Size of the Normal Blind Spot
M Chamlin p 522
Silver Impregnation of Whole Retinas
J Ventura and M Mathieu p 528
*Cell Production and Migration in Epithelial Layer of Cornea
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*Further Studies on Action of Acetazolamide and Venous Pressure of the Eye—F J Macri p 550
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Direct Approach for Transposition of the Parotid Duct
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Role of Lyophilized Vitreous in Experimental Vitreous Opacities of Rabbit—J A Stobbe and A H Keeney p 571
*Early and Late Complications of Extensive Muscle Surgery
L J Girard and F Beltranena p 576
*Ocular Findings in Morquio Ullrich s Disease
G K von Noorden H Zellweger and I V Ponseti p 585
*Diabetic Ophthalmoplegia with Special Reference to the Pupil
J E Goldstein and D G Cogan p 592
*Technique of Cataract Extraction with Alpha Chymotrypsin
H F Hill p 601
*Loss of Light Energy in Retina and Choroid
W J Geeraets and others p 606

Tension Variations in Normal and Glaucomatous Eyes—In our study of 404 nonglaucomatous eyes the mean phasic diurnal intraocular pressure variation was 3 7 mm Hg, 99% of normal people show a variation of less than 7 8 mm Hg during the 24 hours One hundred thirty eight eyes with untreated chronic simple glaucoma were also studied and showed a mean diurnal fluctuation of 11 mm Hg Two-thirds of these eyes showed their peaks of intraocular pressure outside the usual office hours and only 17 eyes (12%) showed pressures consistently over 25 mm Hg throughout the night and day A correlation of this lability of intraocular pressure with the usually accepted signs of simple glaucoma shows that abnormal phasic tension variation is one of the earliest diagnostic criteria and its understanding is important both diagnostically and in supervising treatment

Glare and Age—The ability to recognize visual targets at different distances from a glare source is studied in individuals varying in age between 5 and 85 years The luminance of the screen on which the targets are shown must be increased in proportion to the glare luminance This increase becomes progressively greater with age Comparing individuals in the youngest group (5 to 15 years) and the oldest (75 to 85 years), a 50- to 70-fold increase in luminance of the target screen is needed for the latter At about 40 years of age a sudden acceleration in sensitivity to glare occurs Tests on observers with incipient and extracted cataracts suggest that the opacity of the lens and the entopic scattering of light are the main causes of glare

Reversal of Retinopathy—Intensive plasmapheresis was undertaken to reduce elevated serum gamma macroglobulin and serum viscosity levels in 2 patients with Waldenstrom's macroglobulinemia Each patient had marked increase in distention and tortuosity of the retinal veins, and one had multiple retinal hemorrhages and decreased visual acuity Removal of approximately 14,400 ml of plasma in 30 days and 18,600 ml in 51 days resulted in reversal of these findings coincident with reduction of the total serum proteins from 14 to 9 6 Gm % and 12 3 to 7 4 Gm % and of the serum viscosities from 14 5 to 3 4 and 8 6 to 2 4 (normal 1 4-1 8) It is concluded that elevated serum macroglobulin and serum viscosity are major factors in the pathogenesis of the retinopathy of Waldenstrom s macroglobulinemia and that their reduction by plasmapheresis may result in reversal of the retinopathy

Fluctuations in Size of Normal Blind Spot—This study was undertaken in order to learn how much change in size (width and height) the blind spot may undergo before being considered abnormal, as may be found in early papilledema Eighty-nine eyes in 45 patients with normal fundi were examined The blind spots were plotted on 5 or 6 occasions at intervals of days or weeks, at 1 meter and 2 meters, in millimeters as well as in tangent degrees The widths and heights varied between 0 34° and 0 39° with the tangent rule Despite the angioscotomas, the heights showed no more variation than the widths The mean variants of the 2-meter blind spot showed a slightly lower percentile error than did the 1-meter blind spot (5 0% compared to 5 5%) Tangent rule measurements were as accurate, for clinical purposes, as millimeter measurements

Cell Production and Migration in the Epithelial Layer of Cornea—Tritium labeled thymidine was injected into the anterior chamber of the eyes of various animals, e g , mouse, rat, guinea pig, rabbit, and dog The nuclei of those cells which undergo division up to about 6 hours following the injection were labeled and were identified by autoradiographic analysis At various intervals the corneas were removed and it was found that cell production occurred only in the basal layer of cells in the corneal epithelium By the 3rd to 7th day, depending upon the species, these cells had migrated outward and were sloughed off the surface of the cornea The turnover rate of the corneal epithelium (3 to 7 days) of these animal species would indicate that this tissue is one of the faster growing ones in the body

Action of Acetazolamide and Venous Pressure of Eye—It has previously been reported that acetazolamide produces a fall of eye venous pressure synchronous with the fall of intraocular pressure The present report demonstrated, on anesthetized cats, that the venous pressure still fell even though the intraocular pressure was maintained at a constant level by perfusion of the anterior chamber The author con-

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Titles marked with an asterisk (*) are abstracted

cludes that the lowering of venous pressure by acetazolamide, under these conditions, is probably a primary effect on the vasculature of the eye

Pterygium Surgery Refraction and Corneal Curvature—Corneal curvatures were measured in 48 eyes and refractions in 35 eyes before and after the removal of 50 pterygia in 43 of the patients Measurement in fellow eyes, for control, was possible in 48 instances Follow-up was continued for at least 2 months Corneal curvatures changed 0 37 diopters or more in 24 of 48 eyes In 18 eyes the change was a decrease in astigmatism with the rule The greatest change was 4 50 diopters The refraction changed in 14 of 35 eyes Eight eyes had a decrease of astigmatism with the rule The greatest change was 6 00 diopters The changes in the corneal curvature did not always move in the same amount or in the same direction as did the changes in the refraction The possible causes of these findings are discussed

Preparation of Sections and Museum Specimens of Eyes Using a Polyester Resin—Examination of the eye histopathologically has long been recognised as a difficult procedure due mainly to the fact that the eye is composed of several mixed, hard and soft tissue layers which tend to separate during cutting Paraffin sections leave much to be desired, and celloidin sections, while satisfactory, take too long to prepare A method of plastic-embedding of eyes which gives well-stained sections in 4 or 5 days has been evolved The techniques of embedding, cutting, and staining are described in detail The plastic is known as C M E tissue support resin The block of plastic containing the eye from which the sections have been cut, can afterwards be used as a museum specimen This research was carried out in cooperation with the Department of Pathology at the Vancouver General Hospital, and was supported by a grant from the Vancouver Central Lions Club

Complications of Extensive Muscle Surgery—The purpose of this study was to demonstrate the number of muscles which can be dealt with during 1 operation without damage to the eyeball Six adult cases are presented, in each of which 3 or 4 rectus muscles were operated on during 1 procedure Early postoperative complications were conjunctival chemosis, striate keratitis, and iridocyclitis, late complications were necrosis of the iris, anterior cortical cataract, and hypotonia These complications were not observed in 11 children operated on previously, nor in 67 cases reviewed where all 4 rectus muscles were disinserted simultaneously Adult rhesus monkeys showed postoperative complications similar to those in adult humans, infant animals had uneventful postoperative courses It was concluded that (1) anterior ciliary circulation is more essential to nutrition of the anterior segment of the eyeball in adults than in children, (2) dangers of complications should discourage surgeons from disinserting 3 or 4 rectus muscles in adults during any 1 procedure

Ocular Findings in Morquio-Ullrich's Disease—Morquio's disease differs from Hurler's disease (gargoylism) in several aspects Corneal opacities which are a prominent clinical feature of Hurler's disease are not observed in Morquio's disease Occasionally, however, patients were observed who in addition to the classical skeletal features of Morquio's disease presented corneal cloudiness as well This condition was first recognized by Ullrich and must, at present, be considered as a separate and rare clinical entity, under the name of Morquio-Ullrich's disease Two brothers with this condition were observed by the authors and the clinical findings are reported In view of the debatable classification of Hurler's, Morquio's, and Morquio-Ullrich's disease it is recommended that slit-lamp examination, gonioscopy, biochemical, and histochemical studies are carried out in all patients with any of these conditions

Diabetic Ohpthalmoplegia The Pupil—Twenty-two cases of diabetic 3rd nerve paralysis were reported, and the pupillary responses were compared with those in 39 instances of oculomotor paralysis from other causes Seventeen of the diabetic ophthalmoplegias had sparing of the pupil, 4 had incomplete pupillary involvement and 1 had complete iridoplegia This was in contrast to the pupillary involvement that occurred in 10 of 11 cases of intracranial aneurysm, in all 6 cases of brain tumor and in all 5 with head trauma The diabetic ophthalmoplegia is frequently accompanied by a homolateral headache but diabetic retinopathy is not necessarily present Average duration of the paralysis is 2½ months It may be the initial manifestation of diabetes mellitus, and in some cases a glucose tolerance test is necessary to demonstrate the systemic disease

Cataract Extraction with Alpha Chymotrypsin—The use of chemical zonulysis has not been found to be a substitute for all other techniques Although of great advantage in selected cases, disadvantages were evident in certain types of adult cataracts Modification of the usual enzymic technique was found to be of some value in certain senile cataracts Chemical zonulysis creates new hazards that replace old difficulties, and points of technique were evaluated to reduce these hazards Fluorescein stain was used to determine the extent of flow of the enzyme when using different amounts of the material Profound hypotony, routine light counter-pressure below the lens, slow lens delivery, and very tight wound closure were found to be of prime importance in reducing the hazards

Loss of Light Energy in Retina and Choroid—Spectral absorption coefficients as a function of wavelength for the ocular fundus in rabbit and man were needed for realistic evaluation of the retinal burn hazard from nuclear weapons and for a more thorough exploitation of the clinical uses of light coagulation Data obtained on freshly enucleated eyes using a DK-1 spectrophotometer, within the spectral range 350-1,500 mμ, indicated that the major absorption was confined between 400-1,000 mμ, with peak at 575 mμ Absorption and scatter by human choroid plus retinal pigment epithelium was approximately 25 per cent for radiant energy incident on the cornea and having a spectral distribution similar to that emitted by nuclear weapons and by the xenon pressure lamp The rabbit and human fundus correspond remarkably well in spectral absorption properties

Archives of Otolaryngology

72 425-476 (Oct) 1960

°Secondary Nerve Degeneration in Clinical Otosclerosis p 425
A S Feldman
°Malignant Melanoma of Nose and Paranasal Sinuses and Juvenile Melanoma of Nose—J M Ravid and J A Esteves p 431
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*Positional Otitis Media
R B Duncan p 454
*Further Observations on Leishmaniasis Americana of Upper Respiratory Passages in Panama—L Jaffe p 464
*Transfrontal Ethmoidosphenoidectomy
F Brunetti and G Rossi p 471

Secondary Nerve Degeneration in Clinical Otosclerosis—The term secondary nerve degeneration is commonly applied to findings of nerve involvement measured in later stages of clinical otosclerosis This paper is a report of an investigation of the amount of nerve degeneration found in unoperated otosclerotic ears after the existence of hearing loss for varying periods The amount of existing nerve involvement was evaluated both regarding and disregarding the age factor The results would suggest that secondary nerve degeneration if at all a concomitant of otosclerosis is independent of duration

Melanoma of Nose and Paranasal Sinuses—Two cases of melanoma of the nasal cavity are reported—one malignant and one benign juvenile—together with a critical review of all cases reported in the literature Altogether about 117 cases of malignant melanomas of the nose and sinuses have been reported in the world literature The case of juvenile melanoma of the nose is the only one on record Juvenile melanoma of the nose is a benign tumor, as is juvenile melanoma in general The clinical and pathologic features, histogenesis and prognosis of these tumors are presented It is doubtful whether there is a well-authenticated report of a case of primary malignant melanoma of the paranasal sinuses Criteria for differentiation between primary and secondary malignant melanomas of the nose and sinuses are given The importance of early diagnosis and radical treatment of these tumors is emphasized

Vein Graft Closure of Eardrum Perforations—A central or marginal perforation of the eardrum can be closed by placing a small piece of vein beneath the perforation in the middle ear and encouraging the tympanic membrane to proliferate over it The vein to be used may be removed from the patient s forearm or, if the perforation is larger, from the patient s antecubital fossa The piece of vein selected is freed of surrounding connective tissue and opened it should be just larger than the perforation to be closed The free edge of the perforation is freshened with a right-angle pick to separate the outer cutaneous from the inner mucosal layer The vein is supported beneath the perforation by pieces of gelfoam placed in the middle ear The intima surface is placed downward, toward the middle ear, and the adventitia surface should be uppermost under the perforation The raw edges of the cutaneous layer are drawn out over the vein to encourage closure of the perforation This technique has been successful in more than 90% of cases

Tracheotomy in Poliomyelitis and Similar Diseases—Tracheotomy is an established procedure for certain types of respiratory insufficiency with and without obstruction A simple clinical classification to be used as a basis for determining indications for tracheotomy is presented GROUP 1 Simple respiratory muscle paralysis—tracheotomy is seldom necessary in absence of acute or chronic pulmonary disease GROUP 2 Bulbar group with tenth cranial nerve involvement—selected cases with unrelieved respiratory obstruction require tracheotomy GROUP 3 Bulbo spinal group—tracheotomy is mandatory in patients with respiratory paralysis requiring the tank respirator in whom there is pharyngeal paralysis GROUP 4 Encephalitis: vital center group—because of severity of symptoms, frequency of coma, and respiratory complications tracheotomy is indicated The use of environmental moisture, proper suctioning, and cleansing of tracheal tube is essential for good results Time and method of detubing the patient is based on the individual situation, but in general it should be accomplished as soon as the basic reason for performing the procedure has been resolved

Positional Otitis Media—Positional otitis media occurs in a small number of infants who are bottle-fed in a horizontal or propped-up position A series of 242 infants were diagnosed over 7 years (1952-58) and a study of 180 (1954-58) showed they were taken off the breast earlier and kept on the bottle longer than is usual in New Zealand Interesting associated factors were suckling techniques and bottle-feeding problems the condition of the nose, nursery environment, teething, and position in the family The frequency of adenotonsillectomy and persisting ear conditions was unduly high Sitting the infant upright for feeding will prevent this condition Mothers should do this until the babe is 3 months of age Infants with nasal obstruction, whether allergic or infective, with suspected ear infections and when premature, or hospitalised should always be fed this way

Leishmaniasis Americana of Upper Respiratory Ways—Mucocutaneous leishmaniasis remains a serious health problem in the rural population in many Latin American countries The disease is much more common in Panama than is apparent from a study of the literature, and it may spread as a consequence of cultivation of virgin land In addition to the reports of 8 cases of nasal leishmaniasis published in 1954, a new series of 26 cases was observed One of the new cases also presented a severe leishmanial infection of the oropharynx and larynx Treatment with stibophen resulted satisfactorily

Transfrontal Ethmoidosphenoidectomy—The authors, following their own technique operated on 70 patients suffering from frontal ethmoidosphenoidal chronic sinusitis, frontal ethmoidal mucocele, and frontal ethmoidal osteoma This new surgical technique possible even in cases of hypophysectomy for malignant neoplasm with metastasis, allowed the authors to achieve good clinical and aesthetic results They give the results of their experience and show the anatomic and clinical reasons that led them to devise and to practise this new surgical technique

American Journal of Medicine, New York

29 1-186 (July) 1960 Partial Index

*Hereditary Persistence of Fetal Hemoglobin Family Study
E C Herman Jr and C L Conley p 9
Hemoglobin Metabolism in Thalassemia In Vivo Studies
M Grinstein and others p 18
*Familial Hypogammaglobulinemia Splenomegaly and Leukopenia—D S Kushner and others p 33
*Serum Alkaline Phosphatase Activity in Hepatitis of Infectious Mononucleosis—J A Barondess and H Erle p 43
Cholestatic Form of Viral Hepatitis at Brooke Army Hospital—I N Dubin and others p 55
*Primary Mediastinal Echinococcosis
J Rakower and H Milwidsky p 73
Course and Prognosis of Sarcoidosis
M Sones and H L Israel p 84

Hereditary Persistence of Fetal Hemoglobin—Sickle cell anemia (homozygous hemoglobin S disease) is characterized by hemolytic anemia chronic jaundice, and recurring epi

Hamman-Rich Syndrome in Children—A 4-year-old girl, who had had episodes of febrile dyspnea and cough since she was 2 years old, was hospitalized with polypneic dyspnea and cyanosis Dry, crepitating rales could be heard Blood tests revealed polyglobulism with a normal leukocyte formula An electrocardiogram showed signs of dilatation of the right ventricle, pulmonary roentgenograms revealed moderately abnormal pictures in contrast with the gravity of the respiratory picture The patient was treated with oxygen, blood transfusions, cardiac stimulants, penicillin, and prednisone There was definite and continuous improvement during 11 months while the treatment was maintained One month after the hormonal treatment had been interrupted a new paroxysmal episode occurred, which was treated with prednisone for a short period There was a period of remission, after which the child was again hospitalized She died 15 months after the first admission, during an epidemic of virus A influenza The autopsy findings corresponded to the features found in interstitial pneumopathy (Hamman-Rich syndrome) which is described as a diffuse bilateral pulmonary fibrosis of unkown etiology The disease chiefly affects adults, and only a few cases in children have been reported The main pathological alteration seems to be a subacute, diffuse, inflammatory, interstitial granulomatosis from which all the other lesions stem The course seems to be irreversible, following a pattern of successive crises in a more or less rapid rhythm Hormonal treatment seems to have a suspensive action on the exudative or hemorrhagic lesions, but the interruption of therapy is followed by recurrence of progressive epiodes

British Medical Journal, London

2 85-164 (July 9) 1960

Live Virus Vaccine in Poliomyelitis Historical Aspects
H Koprowski p 85
*Excessive Perinatal Mortality Associated with Evidence of Toxoplasmosis—J S Robertson p 91
*Fulminating Ulcerative Colitis Experience in Management
J E Lennard-Jones and A B Vivian p 96
*Local Corticosteroid Treatment in Severe Ulcerative Colitis—S C Truelove p 102
Resemblance between Sarcoidosis with Hypercalcemia and Hyperparathyroidism—P Ellman and A M Parfitt p 108
Potassium Deficiency in Anorexia Nervosa with Reference to Renal Tubular Vacuolation—R D Wigley p 110
Diagnosis and Treatment of Trichomonal Urethritis in Men
R D Catterall p 113
Traction Alopecia
H V Morgan p 115

Toxoplasmosis in Excessive Perinatal Mortality—Large and persistent differences were noted in the rates of perinatal mortality of 3 adjacent districts in north Lincolnshire during the 3 years from 1956 to 1958, inclusive It was found that these differences were due to variations in the stillbirth rates In one small town (Barton-on-Humber) the stillbirth rate was 59 6 per 1,000 births for the 3 years, whereas a neighboring town (Brigg) had the favorable stillbirth rate of only 9 0 per 1,000, and the surrounding rural district had a rate of 28 1 per 1,000 By the end of 1957 the excessive mortality in Barton was already evident and a survey was begun It was learned from midwives that the fetus was either malformed or macerated in almost two-thirds of all stillbirths in the area This led to inquiries into environmental influences Evidence was obtained that the most probable cause of the difference in incidence of stillbirths in the 3 districts is infection with *Toxoplasma gondii* Of 19 stillbirths that occurred in Barton at least 3, and possibly 10, were probably due to toxoplasmosis In only 3 cases could another cause for the stillbirth be established, and the dye-test titers of 2 of these 3 mothers were among the lowest titers observed in the series Stillbirth may be caused by toxoplasmosis either primarily as a result of the infection or secondarily as a result of obstetric difficulty due to hydrocephaly or malpresentation The high incidence of malpresentation in Barton could be due to toxoplasmosis, there was evidence in 3 of 6 breech presentations that the fetus was already dead or deformed prior to the onset of labor

Fulminating Ulcerative Colitis Management—The authors analyzed the results of various treatments in a group of 32 patients with very severe acute "fulminating" colitis They tried to find answers to the following questions (1) Can treatment with corticotropin or cortisone induce a remission in a fulminating episode of colitis? (2) When should surgical treatment be undertaken and what operation should be performed? (3) Does previous treatment with corticotropin or steroid drugs influence the outcome of medical treatment in these patients? The results of medical treatment were disappointing, 1 patient died, without surgical treatment being attempted, 2 patients responded to conservative measures, and 2 apparently responded to corticotropin in doses of 120 units daily (1 of these 2 patients had failed to respond to 80 units of corticotropin) Four patients were treated by ileostomy alone and all of them recovered, but it is suggested that these results were fortuitously favorable Twelve patients who had received no corticosteroids were treated by subtotal colectomy and ileostomy, 3 of them died and 6 made an uneventful recovery It is suggested that this is the operation of choice in most cases Seven patients who had received corticosteroid therapy were treated by immediate subtotal colectomy and ileostomy, 4 of them died and 2 made an uneventful recovery There was a dangerous deterioration in the condition of 3 of these patients during preoperative medical treatment, 2 patients were not given extra cortisone at the time of operation The colon was torn during colectomy more often among patients who had received corticosteroids than among those who had not received these drugs

Local Corticosteroids in Ulcerative Colitis—Local corticosteroid therapy consists in a rectal drip of hydrocortisone sodium succinate in doses of 100 mg morning and evening This treatment has been used in most patients with severe attacks of ulcerative colitis treated in Oxford hospitals since 1956 Case histories are given to illustrate responses obtained and some of the problems entailed in the use of this form of treatment The tentative scheme of medical treatment for severe uncomplicated attacks of ulcerative colitis incorporates local corticosteroid therapy, its essential features follow General medical measures should be instituted without delay They should consist of (1) correction of dehydration and electrolyte depletion, special attention being paid to potassium depletion, (2) blood transfusion, repeated as often as necessary, (3) maintenance of nutritional state by high-calorie high-protein diet, and (4) vitamin supplements Systemic corticosteroid therapy should normally be given by oral administration (i e, prednisolone in an initial dose of 15 mg 4 times a day) but if there is vomiting, treatment should begin with the intravenous administration of 25 mg of prednisolone phosphate twice daily Retention of evening rectal drip of hydrocortisone sodium succinate is facilitated by the preliminary intravenous injection of propantheline bromide Broad-spectrum antibiotics should not be given orally in ulcerative colitis, but they can be given parenterally for a few day when the fever is high Since the use of local corticosteroid therapy the fatality rate in ulcerative colitis cases in 2 Oxford hospitals has shown a sharp decrease and is now about 1 5% compared with 8% during the previous 12 years

Canadian Journal of Surgery, Toronto

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*Esophageal Stricture Secondary to Hiatus Hernia in the Aged—E M Nanson	p 286
Islet Cell Tumors of the Pancreas J R F Mills	p 291
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Benign Gastric Tumors of Nonepithelial Origin 3 Cases J Couture	p 308
Brain Circulation Time Measured by Radioactive Iodinated Albumin—S Fedoruk and W Feindel	p 312
Carbon Dioxide Narcosis in Postoperative Period R J Baird and W G Bigelow	p 333

Esophageal Stricture Secondary to Hiatus Hernia—Nanson calls attention to a little-recognized syndrome of dysphagia with an insidious onset which occurs mostly in elderly persons It is due to an unrecognized hiatus hernia which produces reflux esophagitis leading to inflammatory benign stricture These strictures are often mistaken for carcinoma of the lower esophagus and are treated as such Four men and 4 women, with this syndrome, have been observed at the University Hospital of Saskatoon since 1955 The youngest patient was 54 years of age She was a woman who had a duodenal ulcer plus a hiatus hernia with stricture The average age of the other 7 patients was 76 years, the oldest being 83 The history of one of the patients is presented in detail The diagnosis hinges upon dilatation of the stricture the taking of a biopsy from within or below the stricture and obtaining gastric mucosa from above the diaphragm Treatment is conservative and consists of adequate dilatation of the stricture plus a continued medical regime of bland diet, antacid medication, and sleeping in a propped-up position

Canadian Medical Association Journal, Toronto

83 143-188 (July 23) 1960 Partial Index

Polyvalent Somatic Antigen for Prevention of Staphylococcic Infection—L Greenberg and Y Cooper	p 143
Mumps Meningoencephalitis Virological and Clinical Study D M McLean S J Walker and G A McNaughton	p 148
A Statistical Review of Intra Ocular Cancer A H Sellers	p 157
*Wilson s Disease (Hepatolenticular Degeneration) During Pregnancy—A L Sherwin and others	p 160

Hepatolenticular Degeneration During Pregnancy—Hepatolenticular degeneration (Wilson s disease) and pregnancy are both known to be associated with alterations in the copper metabolism Ceruloplasmin (copper oxidase), the copper-containing serum protein, increases during pregnancy but is absent or diminished in most patients with Wilson's disease The authors present the history of a 23-year-old woman in whom hepatolenticular degeneration had been diagnosed, and who had a successful full-term pregnancy She experienced a remission of the hepatolenticular degeneration beginning during the first trimester of her pregnancy and persisting for at least 6 months after the delivery of an apparently normal infant Serum copper oxidase activity failed to increase significantly in the mother and was normal in the infant This is a reversal of the normal ratio of maternal to infant values and indicates a placental barrier to serum copper oxidase The most likely explanation for the remission of the disease during and after pregnancy is that a transfer of loosely bound plasma copper from the mother to the fetus provided additional excretion of excess copper

Gastroenterology, Baltimore

39 1-144 (July) 1960 Partial Index

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*Dumping Syndrome W E Abbott and others	p 12
*Ulcerative Colitis in the Aged Z T Bercovitz	p 28
Alcohol and Acid Secretion W T Irvine and others	p 41
Glucagon and Gastric Secretion N Cohen and others	p 48
Gastric Juice and Gastric Atrophy in Dogs W O Smith and others	p 55

Dumping Syndrome—Symptomatic and asymptomatic patients who had undergone various types of gastric surgery for the relief of peptic ulcer over the past 10 years were studied by the authors All the types of operation employed to alleviate peptic ulcer have resulted in a variable number of postgastrectomy disorders associated with dumping It is evident that the only effective operation is one that preserves the reservoir capacity of the stomach This can be accomplished by making a stoma with an internal diameter of 1 to 1 5 cm Many asymptomatic patients who get by with larger stomas either modify their dietary habits have a partial functional or mechanical obstruction to the efferent limb so that the reservoir capacity of the stomach is preserved or are psychologically and physiologically adjusted so that they make the necessary compensatory changes to the dumping of foods into the small intestine Many or all of the signs and symptoms noted in patients with the dumping syndrome can occur in both the patient who has not undergone operation and the "good result postgastrectomy patient These factors can be accurately evaluated by a functional study of the gastrointestinal tract and an appraisal of the individual s neurohumoral response By modifying the diet and by giving sedatives and anticholinergic medication as well as by delving into the patient s reactions and problems, one can usually distinguish between the patient with a hyperirritable intestinal tract, the dumper, and the person who exhibits both difficulties With this knowledge the management of such patients can then be improved

Ulcerative Colitis in the Aged—The clinical histories of 57 patients with ulcerative colitis are reviewed, there were 31 men and 26 women The patients ages ranged from 20 to 79 years, 36 (63%) developed the disease after the age of 50 years The clinical results in this latter group of 36 patients showed that 12 required emergency surgery, 7 of these died postoperatively 2 others died while under medical treatment, and 24 are in clinical remission There is a pattern of increasingly grave prognosis as the age at onset rises Of the 21 patients whose age was under 50 years at the onset of the disease, 76% are in clinical remission, the death of 2 was due to carcinoma, 3 were operated on and are well The pattern of seasonal relapses was particularly apparent in patients in whom the disease smear containing staphylococci rose from 33 to 52% during their hospitalization Of 103 infants born in 1 pavilion 101 were found to carry coagulase-positive staphylococci Staphylococci resistant to penicillin were found in 42% of the infants Many of the strains isolated were of type 187 While some strains were of phage type 80/81, all of which were resistant to penicillin, it became evident that the presence of this phage type did not cause an epidemic Phage typing of all strains isolated revealed that the maternity ward had its own staphylococcic flora The investigation failed to produce evidence that the wearing of masks tends to check the spread of staphylococci Letters of inquiry regarding the occurrence of infections in themselves or their infants, were mailed to 102 mothers 3 months after their confinement Replies were received from 97 mothers, 89 of whom stated that both mother and child had remained free from infection There were 5 cases of mastitis in the 8 remaining mothers, and the infants of 2 of these had infections Three other infants of healthy mothers also had infections

Public Health Reports, Washington, D C

75 573-676 (July) 1960 Partial Index

*Controlled Trial of BCG Vaccination
G W Constock and L W Shaw p 583
Mental Competency in Federal Criminal Cases
C E Smith and K R Strawberry p 595
Rehabilitation Care in Nursing Homes
W E Park and M I Moe p 605
The Peeling House Paint Hazard in Children
E E Hartman and others p 623

Controlled Trial of BCG Vaccination—In April 1947, a controlled trial of BCG vaccination was initiated in the school population of Muscogee County, Ga A total of 11,262 children had completed tests with 5 T U of PPD, and the nonreactors were tested with 100 T U The rate for reactors to 5 T U was 34 per 100,000, and for nonreactors only 9 per 100,000 The degree of sensitivity to 5 T U appeared to be closely related to the tuberculosis case rate Children with no induration from the 5 T U had the lowest rates, whereas students with 10 mm or more of resultant induration had extremely high rates These reactors comprised only 7% of the study population but furnished 80% of the tuberculotic cases during the first 5 years of observation The average annual rate of newly reported cases among the total study population was 26 per 100,000 In this area of low tuberculosis infection rates it was not possible to demonstrate any benefit from BCG vaccination during 12 years of observation It is suggested that in areas of low infection rates, which comprise most of the United States at the present time, the tuberculosis control programs among school populations might profitably be limited to periodic tuberculin testing surveys, with careful follow up of those who had reaction to a low dose

Revista Clínica Española, Madrid

77 161-240 (May 15) 1960 Partial Index

Studies of Venous Blood Pressure
P de La Barreda and A Rapado p 179
*Possible Role of Kidney in Hematopoeisis
H J Castro Mendoza p 186
New Method for Treatment of Bladder Tumors with Au^{198}
L Cifuentes and S Perez Modrego p 191
Effect of Venom of Bothrops Jararaca and B Atrox on
Coagulation—J S Favos and others p 215

Possible Role of Kidney in Hematopoeisis—The role of the kidney in erythropoeisis was studied in 3 groups of dogs (5 dogs in each group) Two groups underwent bilateral nephrectomy and a 3rd group served as control One of the nephrectomized groups also underwent peritoneal dialysis Blood from the femoral artery was used for determination of hematocrit values, urea and hemoglobin levels, and for the xanthoproteic reaction Cytological study of the bone marrow was made with material taken from the femoral diaphysis immediately after killing the experimental animal In dogs with a short survival (up to 120 hours) there was evident decrease in hematocrit and hemoglobin values, in those with a longer survival these values tended to increase The study of bone marrow showed (1) maintenance of the myeloid series regardless of duration of survival, (2) marked decrease in the erythroblastic series, (3) increase of other cell types, especially reticular cells and lymphocytes, and (4) a ratio of myelocytic to erythrocytic elements ranging from 3 04 to 10 82 These results suggest that the kidney produces or activates a factor which acts on the bone marrow, keeping the morphological and functional integrity of the erythropoeitic tissue without influencing the myelopoeitic The clinical importance of this study is to explain, at least in part, the mechanism of anemia in patients with renal diseases

Schweizerische medizinische Wochenschrift, Basel

90 671-690 (June 18) 1960 Partial Index

Present Status of Surgery in Esophageal Atresia
B T Crivelli p 671
Advantages and Disadvantages of Disposable Oxygenator
G Conne and others p 677
Localization of Agglutinants in Electrophoretic
Protein Spectrum—V D Wiedermann and others p 682
*Malignant Exophthalmos (Thyrohypophysial Syndrome)
O Jallut and P M Galletti p 684

Malignant Exophthalmos—In this series (13 men and 15 women with ages ranging from 20 to 71 years) the first exophthalmic signs occurred, on the average, at about the age of 45 years In 4 of the 12 patients with malignant exophthalmos associated with hyperthyroidism the 2 conditions had appeared simultaneously, in 8 the exophthalmos had preceded hyperthyroidism In 12 patients exophthalmos appeared after treatment with synthetic antithyroid drugs or radioactive iodine, and 4 patients were euthyroid at the onset of exophthalmic signs Malignant exophthalmos has a pituitary origin A small percentage of patients is likely to develop thyrohypophysial syndrome immediately or some years after antithyroid therapy, a larger group, comprising patients with clinical signs of Lamberg's thyrohypophysial syndrome, is likely to develop malignant exophthalmos Thyroidectomy is contraindicated in complicated hyperthyroidism, synthetic antithyroid drugs and radioactive iodine must be administered cautiously to prevent a sudden reduction of thyrotoxicosis and development of myxedema Treatment of malignant exophthalmos requires the withdrawal of antithyroid therapy and the administration of high doses of thyroid hormones as soon as signs of hypothyroidism occur If there are congestive symptoms prednisone (40 mg daily or more) or ACTH (80 UI daily) should be given If unsuccessful at the end of 2 to 4 weeks this therapy should be discontinued Early irradiation of the hypophysis is recommended If there are signs of eye damage orbital decompression is the most effective surgical procedure

WASHINGTON NEWS

Flu Warning
Hurricane Report
Miscellany

FLU WARNING ISSUED

Routine vaccination against influenza for persons with heart and blood vessel disease was urged by the American Heart Association and the U S Public Health Service

"Evidence of the past 3 years has abundantly confirmed that the dangers of influenza are much greater for patients with heart or lung disease than for others,' the organizations said The risk is particularly high for those with lung congestion due to heart disease Also, it is clear that the threat of influenza is continually recurring We recommend that heart patients seek the advice of their physicians with regard to obtaining the protection offered by routine vaccination

'The epidemics of influenza which occurred in the fall of 1957, the spring of 1958, and the first quarter of 1960 have again emphasized the fact that individuals with cardiovascular or pulmonary disease are more susceptible to the hazards of influenza than is the general population The increased risk is shown both by more severe illness and by higher fatality rates among patients with these diseases

Evaluation studies with influenza virus vaccine have shown that its use is of definite value in preventing influenza In adults, side reactions have been extremely few and use of the vaccine is contraindicated only in those patients who are allergic to components of the vaccine The Public Health Service Advisory Committee on Influenza Research has strongly recommended that those persons at high risk of death from influenza obtain immunization as a protective measure Because influenza epidemics recur in unpredictable cycles, and particularly because some influenza occurs continually, annual immunization has been recommended

'The American Heart Association and the National Heart Institute wish, therefore, to bring these facts to the attention of all physicians In addition, it is urged that persons with cardiovascular disease consult their physicians as to the advisability of obtaining routine influenzal vaccination"

Meanwhile, a PHS study of the 1957 influenza epidemic declared there was a 'striking lack of concern" about the epidemic, despite efforts by the PHS and the medical profession The study attributed the lack of concern to a belief that it was a minor disease

FDA CITES HURRICANE VIGILANCE

The Food and Drug Administration (FDA) reported its inspectors moved quickly in the aftermath of hurricane Donna in September to guard against contaminated foods and drugs

In the Florida Keys, inspectors found a food store so heavily damaged that the State Board of Health ordered it to be burned, along with its entire stocks

Other FDA inspectors checked food processing plants as well as retail stores

In Norfolk, Va warehouses located along the waterfront suffered the major storm damage Virginia state inspectors immediately embargoed water-damaged establishments, pending assessment of damages and an orderly segregation of affected merchandise State and FDA inspectors accompanied damaged lots to points where they were destroyed

During the height of the storm in New York City, waterfront streets were heavily flooded Large amounts of food on the piers in lower Manhattan and Brooklyn were wet by wind-driven, polluted, harbor water FDA inspectors joined city and state authorities in an immediate survey after local embargoes had been placed on domestic products and FDA detentions on imported merchandise Two hundred and fourteen lots of foods, including more than 2 6 million pounds of coffee and cocoa beans, and large quantities of tea, spices, and miscellaneous foods awaiting import clearance, were refused entry, and seizures were made of 22 lots of various foods, drugs, and cosmetics destined for export, because they were damaged by 2 feet of contaminated harbor water State authorities condemned more than 21,000 lb of food found damaged in the 743 establishments investigated

(Continued on next page)

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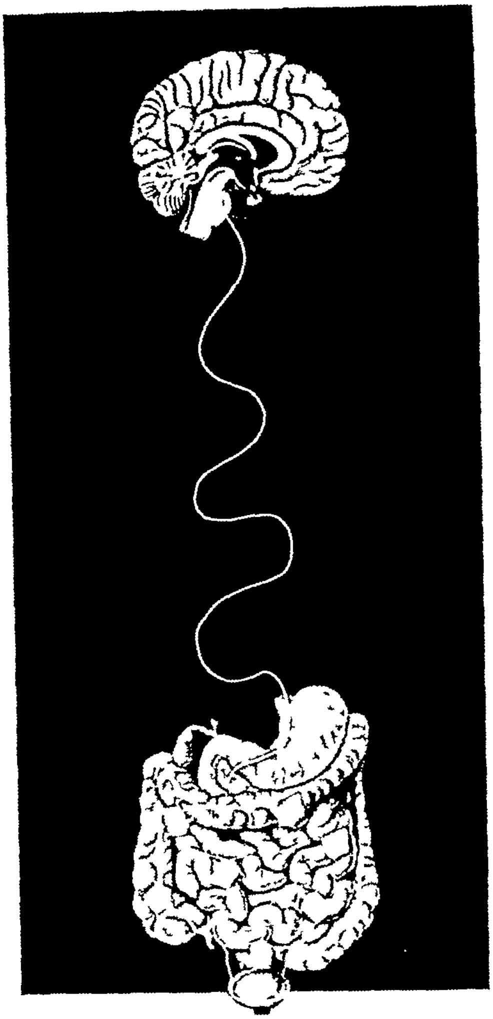
MISCELLANY

Competitive examinations for appointment in the Regular Corps of the U S Public Health Service will be held throughout the country January 31 through February 2 or 3, 1961 Applications must be made before Dec 2, 1960 Medicine, dentistry sanitary engineering, veterinary medicine, dietetics, clinical psychology, social work, health education, and physical therapy are the health career fields covered The examinations are given at the Public Health Service examining center nearest the applicant's home, school, or place of business Application forms may be obtained by writing to the Surgeon General, U S Public Health Service, Washington 25, D C, Attention Division of Personnel

The Public Health Service awarded $91,636,694 in training grants, research fellowships, and traineeships through its principal research center, the National Institutes of Health, during the fiscal year ending June 30, 1960 A detailed accounting, by state and institution, of these awards for advanced training in the medical and biological sciences is contained in a new publication—*Public Health Service Grants and Awards by the National Institutes of Health, Fiscal Year 1960, Part II* Copies of the booklet may be obtained from the Superintendent of Documents, U S Government Printing Office, Washington 25, D C Ask for Publication No 777, Part II The price is 50 cents

Twelve drugs and devices were alleged by the FDA to be misbranded by false and misleading claims of therapeutic benefit Five were vitamin products promoted for the prevention and treatment of disease conditions A misbranded scalp preparation carried no warning that use in case of rash may cause serious mercury poisoning A drug marketed without safety clearance was promoted in booklets for the medical profession which falsely claimed that the product was an effective treatment for inoperable cancer Mechanical chairs and massage devices were misbranded in accompanying literature for the treatment of arthritis and rheumatism pains The chairs were also promoted for heart trouble, and the massagers for weight reduction Two products seized from a discount drug house were counterfeits of well-known brands of diuretic drugs permitted to be sold only after safety clearance, which had not been secured for the imitation tablets

The U S Public Health Services reported a continuing decline in the outbreak in new polio cases throughout the nation The PHS reported there were 117 new polio cases for the week ending Oct 15, of which 74 were paralytic The total for the preceding week was 131 cases, including 101 paralytic Last year, for the week ending Oct 17, some 299 new polio cases were reported The total national incidence of polio at this time last year was 6,951 compared to 2,553 cases reported so far this year



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dosage One tablet three times daily

supply Aqua-colored, compression-coated tablets containing 15 mg of Pro-Banthīne (brand of propantheline bromide) and 5 mg of Dartal (brand of thiopropazate dihydrochloride)

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[1] Hock C W Treatment of Gastrointestinal Disorders with an Anticholinergic Tranquilizer Combination J M A Georgia 48 218 (May) 1959
[2] Investigators Clinical Reports Analysis of reports by 117 physicians in 500 patients
[3] Borowsky H Schwartz S A and Lister J : Experience with Short Term Intensive Anticholinergic Therapy of Peptic Ulcer Am J Gastroenterol 27 156 (Feb) 1957

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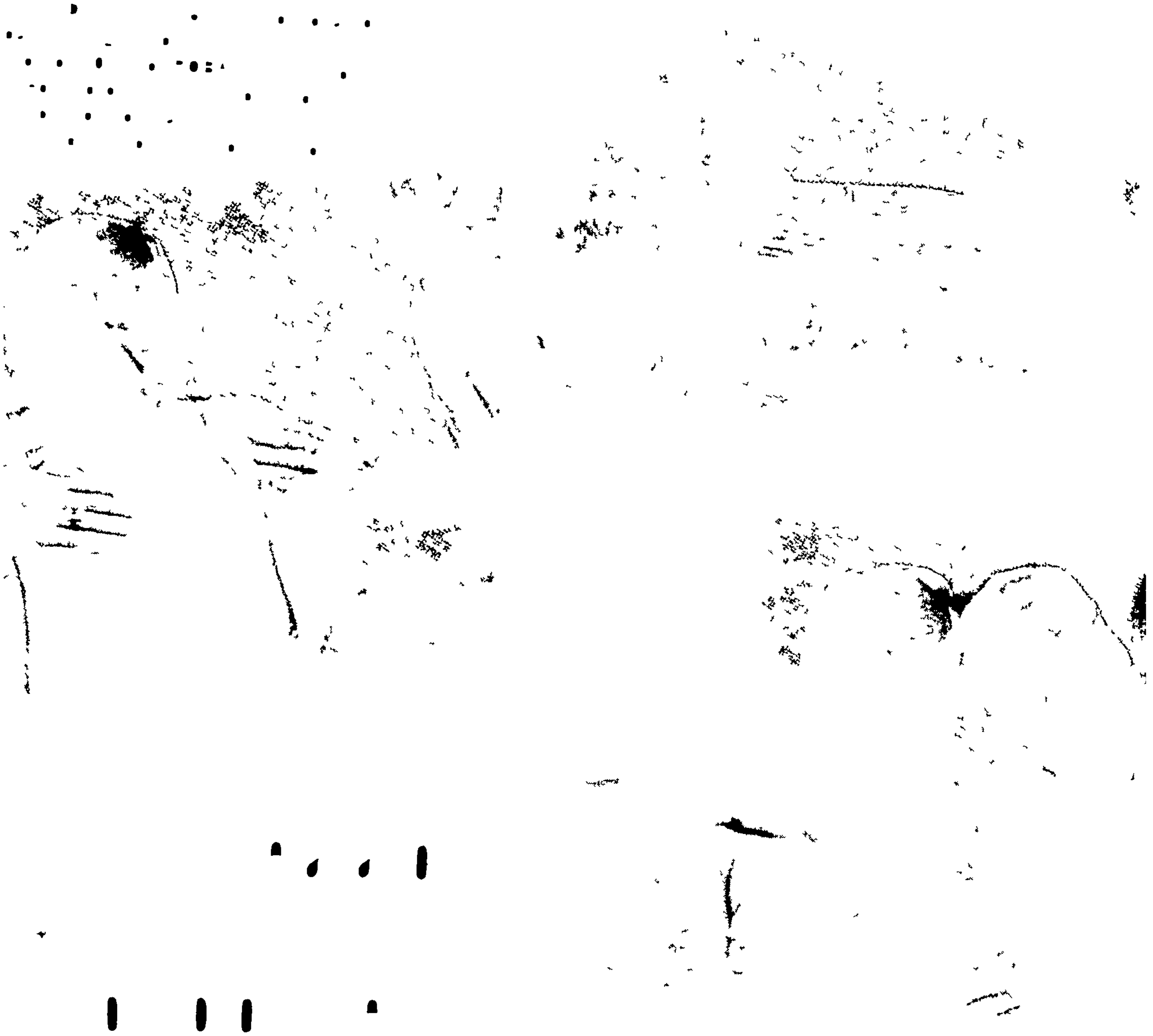

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Medical News

Site of This Year's Clinical Meeting Is Nation's Capital

Washington, D C, will be host city for the American Medical Association's annual Clinical Meeting to be held there Nov 28-Dec 1 The nation's capital, often called the political capital of the free world, could also qualify as the medical capital

The city is the center of medical research activities in this country, it has two of the finest medical museums in the nation, the most comprehensive medical library in the world, the National Naval Medical Center in nearby Bethesda, Md, and the famous Walter Reed Army Medical Center and Hospital The vast activities of the U S Public Health Service and Department of Health, Education, and Welfare are directed from Washington Here, the Food and Drug Administration cracks down on quackery and polices the safety of food, drugs, and cosmetics

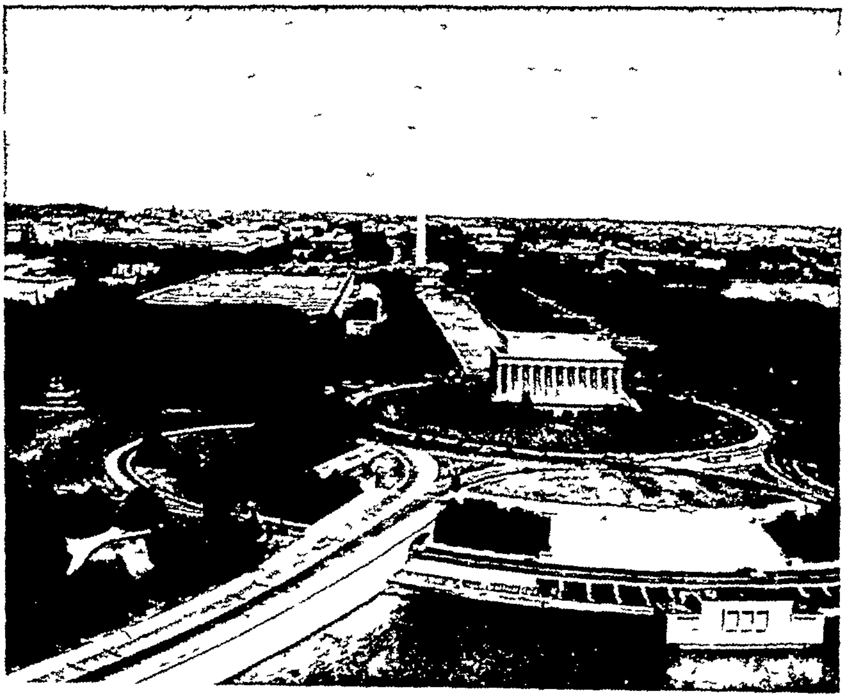
There are three medical schools in the District of Columbia—at Georgetown University, George Washington University, and Howard University Only a short drive away is the Johns Hopkins University Medical School at Baltimore

Supporting its claim to be the medical capital of the country is the fact that Washington easily leads all other cities in the number of physicians per capita of population—more than one in 300, which is well over twice the national average Physicians in the Army, Navy and Air Force Medical Corps, the U S Public Health Service, and in other governmental activities, coupled with those in private practice, are responsible for this unusually high percentage

If time is available, physicians and others attending the clinical meetings should consider a tour of some places of medical interest as an informative adjunct to the meeting

Only a 20-minute drive north from the headquarters hotel, in Bethesda, Md, lies the sprawling National Institutes of Health on a 305-acre tract of land Across the road is the towering, white Bethesda Naval Hospital where many dignitaries have been treated

NIH conducts or supports nearly half of the medical research done in the U S The bulk of its annual appropriations (560 million dollars this year) goes toward grants to private institutions However, much work is done at NIH itself by about 9,000 full-time workers, including 1,070 with doctoral degrees, about half of which are medical In the 14-story, 500-bed Clinical Center, which dominates the NIH complex, about twice as much space is provided for laboratories as for patient care Other buildings house the NIH's seven Institutes—Allergy and Infectious Disease, Arthritis and Metabolic Diseases, Cancer, Dental Research, Heart, Mental Health, and Neurological Diseases and Blindness



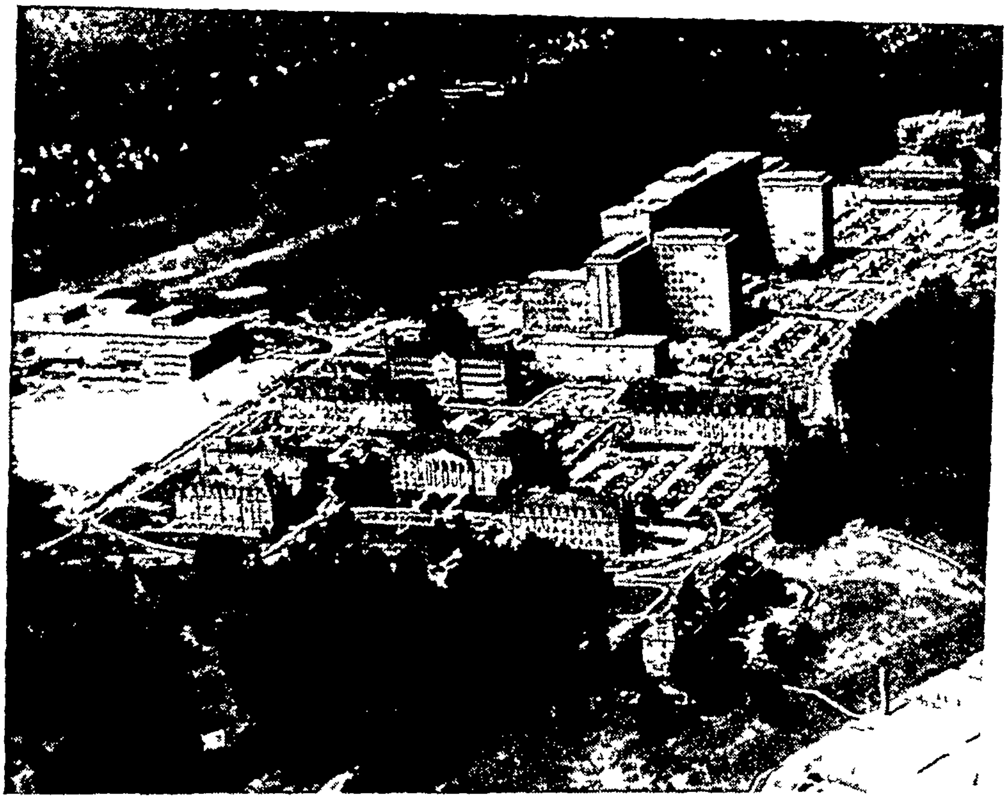
Aerial view of Washington, D C

One of the most famous hospitals in America is the Walter Reed Army Medical Center and Hospital, which is about a 20-minute drive north on Georgia Avenue from the headquarters hotel Walter Reed houses the Armed Forces Institute of Pathology, which has an extensive museum display of pathological exhibits Much important research is done in Walter Reed's famous germ-free laboratory

Within a few blocks of each other on Independence Avenue, downtown, are three places of medical interest—the Department of Health, Education and Welfare (including the Public Health Service, Food and Drug Administration, Social Security Administration, and Department of Education), the renowned Armed Forces Medical Museum, and the National Library of Medicine This is the most complete medical library in the world, containing over one million volumes

It is expected that all the institutions mentioned above will arrange special tours for those attending the Clinical Meeting

A first-time visitor to Washington will wish to see famous tourist attractions such as the Capitol Building, the Supreme Court, the Folger Shakespeare Library, the Library of Congress (largest library in the world), the Washington Monument, the Lincoln Memorial, the Jefferson Memorial, the White House, Arlington Cemetery, Mount Vernon, the National Museum, the Smithsonian Institution, the National Gallery of Art, the Pentagon, and so forth



National Institutes of Health, Bethesda, Md

Less well known perhaps are three unique religious establishments the National Shrine of the Immaculate Conception (largest Catholic Church in the U S and seventh largest in the world), Washington Cathedral, a national meeting place for all Christian denominations and burial place of President Woodrow Wilson and other historical figures, and the new Moslem Islamic Center, the only mosque in this country (visitors must remove their shoes) The two latter buildings and many foreign embassies, including the Japanese and British (with a large modern addition), may be seen on a short drive up Massachusetts Avenue from Dupont Circle to Wisconsin Avenue

If time is pressing, many of Washington's sights can be seen during a 30-minute ride starting with a circle of the Capitol Building and including within a few blocks the House Office Buildings, then proceed down Constitution Avenue, heading west, past the National Gallery of Art, the Federal Trade Commission, the National Archives, the Justice Department, the National Museum, the Labor Department, the Commerce Department, the Washington Monument, the White House, the Pan American Union, the Federal Reserve Board, the National Academy of Sciences, the American Institute of Pharmacy and, finally, the Lincoln Memorial

Another hour will permit a drive to Mount Vernon via Alexandria Cross the Memorial Bridge next to the Lincoln Memorial Directly ahead is Arlington National Cemetery and the three tombs of the Nation's Unknown fighting men The yellow house in the center of the cemetery visible from the bridge is the mansion of Robert E Lee which is fully furnished in period pieces and open to visitors Turn left down the parkway to Alexandria (about 15 minutes), on the way the Pentagon may be seen on the right The tall structure looming up to the south and west is the George Washington Masonic Memorial in Alexandria In the old Virginia town turn left for a few blocks and then right for a while and see some of Alexandria's famous town houses, many dating back to colonial days On the main street, on the right, is Christ Church which was attended by Washington and Lee

After leaving the town, drive for 10 or 15 minutes down the tree-bordered parkway to Mount Vernon

NOTES

- In Washington Cathedral grounds are herb and glassware shops which may interest the ladies
- Gardeners are advised to visit the Botanic Gardens next to the Capitol grounds
- Georgetown's famous old houses of Federal and Victorian style are generally considered to make up one of the most charming town house sections in the country, rivalling Beacon Hill and Philadelphia's Rittenhouse Square area
- Connecticut Avenue, south from headquarters hotel, is considered to be the "Fifth Avenue" of Washington, with many of the city's most exclusive shops and restaurants
- Taxi fares in Washington are among the most reasonable in the country When travelling from downtown to headquarters hotel, or vice versa, ask the driver to take you via Rock Creek Park

- Washington s winter weather averages 37 degrees In early December there may even be balmy 50 and 60 degree days Snow is unlikely
- Congress will not be in session but construction work will have started on the inaugural stands in front of the Capitol
- Sight seeing buses leave the downtown area frequently for morning afternoon, or all-day tours at reasonable prices Groups of three or four persons might take limousine tours or taxis with qualified guide drivers (not all taxis have such drivers)

ARIZONA

Surgeons Meet in Tucson—The fall clinical congress of the Arizona Chapter, American College of Surgeons, will be held at the new Tidelands Motel, Tucson, Nov 17-19 The congress will be open to all doctors of medicine interested in surgery The following program has been arranged

- Dr Warren H Cole, Chicago, Cancer Chemotherapy and Strictures of the Common Duct'
- Dr George C Morris Jr, Houston Texas, Surgical Treatment for Arteriosclerotic Disease and Surgical Treatment for Renal Hypertension
- Dr J G Moore, 'Endometriosis and Hysterectomy—Abdominal *vs* Vaginal
- Dr John E Estes, Phoenix Atherosclerotic Aneurysms and Occlusion Selection for Arterial Surgery
- Dr Harold E Crowe, Los Angeles, The Diagnosis of Personal Injuries
- Dr John W Brown, Berkeley, Calif, The Staph Problem—A Surgical Responsibility'
- Dr Daniel T Cloud Jr, Phoenix, Simulated Surgical Bowel Obstruction in Children
- Lt Thomas Mildebrandt, Arizona Highway Patrol, A Law Enforcement Officer Looks at Intoxication as an Accident Cause

Papers and clinical discussions will be held in the forenoon on Thursday, Friday, and Saturday In the afternoon one may choose between cineclinics and golf For the banquet Thursday evening Senator Barry Goldwater will be the speaker The suggested title for his presentation is 'The Election—Its Effect Upon the Patient and the Doctor"

FLORIDA

Southeastern Cancer Seminar—The director of the Armed Forces Institute of Pathology, Col Frank M Townsend, will discuss the activities of the institute, which serves as the laboratory for the armed forces, Veterans Administration, and federal agencies, and its role in the cancer program at the Southeastern States 1960 Cancer Seminar Col Townsend is one of 16 physicians, surgeons, pathologists, and radiologists who will address the seminar at the Cherry Plaza Hotel in Orlando, Fla, Nov 16-18 on the theme, "New Frontiers of Cancer Research and Therapy' The seminar is sponsored by the Orange County (Fla) Medical Society through the cooperation of the American Cancer Society and the Florida State Board of Health It has general practice credit approval

ILLINOIS

Increase in Accidental Poisoning in Children—During the first 8 months of this year, there were more than 4,100 reported cases of accidental poisoning among children up to age 12, according to Dr Leroy L Fatherree, Joliet, director of the Illinois Department of Public Health For the same period of 1959, cases reported were slightly more than 3,300 Of the 4,100 cases this year, almost 3,900 occurred in children up to and including age 4, with the highest percentage among 2-year-old children About one-third of all poisoning cases in this age group were the result of "aspirin or aspirin products' A new state law, administered by the Public Health Department, demands that all hazardous substances intended or suitable for use in households be plainly labeled to show the hazard Household preparations rank second in causes of accidental poisoning among children Centers for the emergency treatment of accidental poisoning in hospitals, on a 24-hour service basis, have increased from 2 in 1956 until now there are 62 centers throughout the state Each center maintains reference material on ingredients incorporated in commercial products and recommends treatment methods The goal is to have a center within every 25-30 mile radius

Chicago

Hospital Appointment—The Children's Memorial Hospital announced the appointment of Dr Orvar Swenson, Boston, as surgeon-in-chief to succeed Dr Willis J Potts, who has retired after 14 years in that position Dr Swenson is currently at the Boston Floating Hospital for Infants and Children where he has served as surgeon-in-chief since 1950, and the New England Center Hospital where he has been senior surgeon since 1950

Reception for Gynecologist from Jerusalem—The Chicago Chapter of the American Friends of the Hebrew University and its medical section, the American Jewish Physicians Committee, honored Dr and Mrs Bernhard Zondek, of Israel, at a reception Oct 23 The Chicago committee for the reception was headed by Dr Solmon J Benensohn, general chairman, with Dr Paul Hurwitz as co-chairman, and Dr Abraham F Lash, chairman of the day Dr Zondek, who is chairman of the department of gynecology and obstetrics, Hebrew University of Jerusalem Medical School, is touring the country in behalf of funds for the new medical school building which is being built in Jerusalem

German Professor's Study Tour of Medical School—Fourteen professors from the Free University of West Berlin visited the University of Chicago to study its medical school The visiting physicians toured the medical school, hospitals, and research

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Physicians are invited to send to this department items of news of general interest for example those relating to society activities new hospitals education and public health Programs should be received at least three weeks before the date of meeting laboratories The German faculty members were accompanied on their tour by two members of the staff of the Johns Hopkins Hospital, Baltimore Dr John C Harvey, associate professor of medicine and Dr Henry N Wagner Jr, assistant professor of medicine and assistant professor of radiology In 1958 it was decided that a new teaching hospital would be built in West Berlin to provide facilities for the medical faculty of the Free University The hospital buildings are to be financed jointly by the West Berlin government and the United States government, with design and construction determined by the Benjamin Franklin Foundation, a joint U S A-German nongovernment group

INDIANA

Personal—Dr Carl A Bunde, a vice-president of Pitman-Moore Company, has been placed in charge of medical affairs for the pharmaceutical firm and named scientific director of Allied Laboratories, Inc In his new capacity, Dr Bunde will be responsible for all medical and veterinary clinical research for the Indianapolis firm in addition to serving as scientific advisor to the various subsidiaries of the parent company, Allied Laboratories, Inc —Dr George Plain, of South Bend, has been elected to the board of directors of United Community Funds and Councils of America Dr Plain is currently serving United Community Funds and Councils as chairman of the Committee on Local Health Programs, an advisory group concerned with the development of a coordinated, community approach to health problems by voluntary health agencies The new board member is chairman of the Indiana Better Health Foundation, a central organization formed to accept and channel funds for health research and other phases of educational and rehabilitation programs

MARYLAND

Dr Richards Named Head of Ophthalmology Department.—The board of regents of the University of Maryland has approved the appointment of Dr Richard Richards as professor of ophthalmology and head of the department in the School of Medicine Dr Richards is the university's first full-time professor of ophthalmology, although the specialty has been represented at the medical school since 1867, when the first chair of ophthalmology and otolaryngology in the country was founded there Dr Richards has been assistant professor of ophthalmology at the State University of Iowa for the past two years A native of Michigan, he attended the University of Michigan, where he received a medical degree in 1951

MASSACHUSETTS

Break Ground for Nutrition Research Building—Ground was broken Oct 19 for the new 4-level nutrition research building to be erected by the Harvard School of Public Health at a site along Huntington Avenue, near the intersection of Shattuck Street, in Boston The nutritional research building, where biological and medical sciences will be applied to human nourishment and its relation to heart disease, obesity, and other disorders, has been made possible through a gift of $102,600 a year for 10 years from the General Foods Corporation An additional grant from the National Institutes of Health (U S Department of Health, Education and Welfare) Research Facilities Branch, in the amount of $529,000 has been awarded for the construction of the building

Workshop for Hospital Volunteer Directors—A workshop to train directors of volunteers for hospitals and other health agencies is offered this fall by Boston University in cooperation with the Massachusetts Hospital Association The workshop will be conducted from 4-6 P M every Thursday from Oct 27 through Feb 16 at the university's School of Public Relations and Communications The workshop is designed to give specialized training in volunteer department organization and administration to volunteer directors of hospitals and other health agencies and of health agency auxiliaries, and to volunteers interested in learning more about the role of the professional volunteer director

MICHIGAN

Students Receive Awards—Dr William N Hubbard Jr, dean of the University of Michigan Medical School, has named 5 students to share a $2,500 grant from the Detroit News Medical Aid Fund The awards of $500 each were given on the basis of "need and proven ability in medical studies" to 4 juniors and 1 sophomore The students are Lyn Ellen Dykman, sophomore, of Grand Rapids, William Duer Burton, Ann Arbor (Burton also has been awarded two student research fellowships), David Keith Hickok, Plainwell, John Raymond Ladd, Midland, and Donald Duane Worcester, Big Rapids All 5 rank in the upper 10% of their medical classes

MISSOURI

First Annual M D Day Held—The first annual M D Day was held at the University of Missouri Medical Center, Columbia, Oct 21 and 22, to initiate a series of annual scientific sessions for all medical alumni of the university and all medical doctors in Missouri, Dean Vernon L Wilson of the School of Medicine announced M D Day at the center will be presented by the School of Medicine and the University of Missouri Medical Alumni Association The scientific session, the principal event of the program, was held all day Oct 21, starting at 9 A M, in the Medical Center Auditorium, and consisted of 7 talks and a panel discussion on medical problems of current interest Participants in the scientific session included a guest faculty of four out-of-state medical men Dr Elexious T Bell, professor emeritus of pathology, University of Minnesota School of Medicine, St Paul, Dr Cly H Hatcher, head, division of orthopedics, Stanford University School of Medicine, Palo Alto, Calif , Dr John F Holt, professor of radiology, University of Michigan School of Medicine, Ann Arbor, and Dr William B Goddard, associate professor of obstetrics and gynecology, University of Iowa City

MONTANA

State Medical Election—At the annual meeting of the Montana Medical Association, the following members were elected president, Dr Raymond F Peterson, Butte, president-elect, Dr Everett H Lindstrom, Helena, vice-president, Dr Harold W Fuller, Great Falls, secretary-treasurer, Dr William E Harris, Box 982, Livingston, Mont , assistant secretary-treasurer, Dr Albert L Vadheim Jr , Bozeman, delegate to the A M A , Dr Paul J Gans, Lewistown, and alternate delegate, Dr S C Pratt, Miles City Dr Peterson, Butte, who was installed as president, resigned this office on Nov 1 Due to circumstances beyond his control, it has become necessary that he move from Butte to Fullerton, Calif On Nov 1, therefore, Dr Harold W Fuller, vice-president, assumed the duties of president for the current administrative year of the association, which will expire Sept 16, 1961

NEBRASKA

Diabetes Detection—During Diabetes Detection Week, Nov 13-19, each citizen in Nebraska will be encouraged to have a diabetes test done by his family physician The program is under the direction of the Diabetes Committee of the Nebraska State Medical Association, of which Dr Morris Margolin, of Omaha, is chairman The goal is to find as many as possible of the about one million undetected persons who have diabetes but do not know it, and to educate the public on the symptoms and the importance of early detection and control of diabetes

NEW JERSEY

Regional Meeting of Physicians in Princeton—The 15th annual New Jersey Regional Meeting of the American College of Physicians will be held Nov 9 at the Nassau Inn, Princeton The following papers will be presented

- Value of Tranquilizer Group of Medications in Office Practice, Dr Robert S Garber, Princeton
- Complications and Side Effects of Tranquilizing Drugs, Dr Duncan E Hitchcon, Maywood
- Radio-Isotopes—Their Use in Diagnostic and Durative Medicine in a Community Hospital, Dr Louis J Levinson Newark
- Should Cardiac Catheterization Studies Be Performed in a Community Hospital? Dr Richard T Cathcart, Philadelphia
- Enzymes in Diagnosis and Treatment, Dr John LaDere
- Present Views on Staphylococcus Infections, Dr Harold L Israel, Philadelphia
- Present Views Regarding the Use and Abuse of Antibiotics, Dr Chester S Keefer, Boston

Dr Keefer will be guest speaker at the dinner For information, write Dr John R Burbidge, 163 Nassau St , Princeton, N J

Slide Seminar in Newark—The New Jersey Society of Pathologists, with the New Jersey State Department of Health cooperating, will hold its 10th annual slide seminar at the Essex House, Newark, on Dec 3, 2 P M The moderator will be Dr Abner Wolf, division of neuropathology, College of Physicians and Surgeons, Columbia University The micro slides and case histories have been mailed out These cover interesting tumors of the central nervous system As usual, many out-of-state pathologists will attend and all physicians are invited The annual seminar dinner will follow the meeting

NEW YORK

Rebecca C Lancefield Honored—Prof Rebecca C Lancefield, of the Rockefeller Institute, has received the third T Duckett Jones Memorial Award of the Helen Hay Whitney Foundation The award, in the amount of $6,500, was conferred for 'her long and continuing studies which are so largely responsible for the present knowledge of the biology of hemolytic streptococci ' The presentation took place during the foundation's third annual meeting of research fellows and established investigators as well as its second Connective Tissue Conference Dr Lancefield is the second woman to be named a full professor by the Rockefeller Institute and the first woman to receive the Jones Award The award to Dr Lancefield was made possible by income from the T Duckett Jones Memorial Fund and the Helen Hay Whitney Foundation Dr Lancefield served as a civilian with the Office of Scientific Research and Development in 1944 and is a past-president of the Society of American Bacteriologists She is vice-president of the American Association of Immunologists and is a member of the Harvey Society and a fellow of the New York Academy of Medicine

New York City

Symposium on Diabetes—The Eighth Symposium Day of the Clinical Society of the New York Diabetes Association will be held Nov 11 at the Hotel New Yorker The theme of the meeting is Genetic Aspects of Diabetes Mellitus and Pre-Diabetes' Dr Sydney S Gellis, of Boston, will give the special lecture, titled "The Infant of the Diabetic Mother " The afternoon session will feature a clinical panel on pre-diabetes and evaluation of diagnostic tests The guest speaker at the dinner, Dr S Jay Tepperman, Syracuse, will present "Some Explorers of Inner Space" For information, write N Y D A, 104 E 40th St, New York 16

Internists' Day in the Bronx—The Bronx Chapter of the New York State Society of Internal Medicine is holding an Internists' Day on Wednesday, Nov 9, 9 A M to 5 P M, at the Concourse Plaza Hotel There will be panels on cardiac disease and cancer A luncheon will be held between 1 and 2 30 P M Dr E Michael Bluestone will be the luncheon speaker All physicians are welcome For information, write Dr Maxwell Spring, Chairman, Program Committee, 800 Grand Concourse, Bronx 51, N Y

Student Awarded Scholarship—The State University of New York Downstate Medical Center in Brooklyn on Oct 10 awarded the 1960-1961 Dave Luckman Scholarship of $1,000 to Harvey Orlin, a fourth-year medical student A member of Alpha Omega Alpha, the national honorary medical society, Mr Orlin last year received the William and Raynore Engel Scholarship of $715 awarded by the Downstate Medical Center's Alumni Association The annual Luckman award is provided by the Dave Luckman Memorial Foundation, organized in 1955 by friends and associates of the late Dave Luckman, merchandising manager of Gimbel's, to provide trust funds for the establishment of scientific educational endeavors

Personal—Election of Dr Ray E Trussell, director of the School of Public Health and Administrative Medicine of Columbia University, to the board of directors of Associated Hospital Service of New York was announced Oct 17—Dr Kenneth W Smith, medical director of Johns-Manville Corporation, has been appointed to the Medical Advisory Council of the American Association of Industrial Nurses, national organization of the industrial nursing specialty The council is composed of industrial physicians who counsel with the nursing group on principles and practices relating to industrial medicine and nursing

PENNSYLVANIA

Medical Examinations for Driving License Applicants—Applicants for driver licenses in Pennsylvania must pass a medical examination conducted by their own physician They must be free from disabling neurologic, cardiovascular, neuropsychiatric, or convulsive disorders, alcoholism, narcotics addiction, and uncontrolled diabetes and epilepsy Of 78,000 applicants since June 1 of this year, only 67 have been rejected, 45 were men Neurologic and neuropsychiatric disorders were the main cause for disqualification The state plans over the next 10 years to have all its 5,500,000 drivers examined for medical eligibility for licensing

Philadelphia

Posthumous Honor Conferred on Dr David Grice.—In an unprecedented action, the American College of Surgeons, meeting in San Francisco, honored the late Dr David S Grice, chairman of the department of orthopedic surgery, University of Pennsylvania School of Medicine The following statement was made by the college's board of regents

> Killed in the tragic airline crash in Boston, Oct 4, 1960, Dr David S Grice was professor of orthopedic surgery and chairman of the department at the University of Pennsylvania School of Medicine Dr Grice was a graduate of the University of Rochester School of Medicine and had basic training at Strong Memorial Hospital in Rochester He received his orthopedic training at the Boston Children's Hospital and Massachusetts General Before moving to Philadelphia, Dr Grice practiced in Boston, where he was assistant clinical professor of orthopedic surgery at Harvard Dr Grice was to have been initiated into Fellowship in the College By unanimous consent of the Board of Regents, his degree will be conferred upon him posthumously

RHODE ISLAND

Swedish Pediatrician to Visit Hospital—Dr John Lind, chairman, department of pediatrics, Karolinska Institute, Stockholm, Sweden, will serve as chief pro tempore, department of pediatrics, Rhode Island Hospital, Nov 7 and 8, Dr Henry F McCusker, director of Medical Education at the hospital announced

TEXAS

New Medical Research Buildings for Houston—Three new medical research buildings are to be constructed for the use of Baylor University College of Medicine at the Texas Medical Center, Houston The new buildings have been designated as the Jesse H Jones Clinical Research Building, the M D Anderson Basic Science Research Building, and the Jewish Medical Research Institute They will contain 225,000 ft of floor space in the aggregate and will more than double the present space facilities of the College of Medicine There will be more than 300 research laboratories, including 7 cold room laboratories The total cost of the project will be $6,000,000, and it is hoped that it will be completed in 18 months Construction of the buildings is made possible by a grant of $1,000,000 from Houston Endowment, Inc, another of $1,000,000 from the M D Anderson Foundation, and $450,000 from members of the Jewish community in Houston The balance has been provided by the Health Research Facilities of the National Institutes of Health

VIRGINIA

Kidney Disease Study in School Children.—A program designed to detect early cases of kidney infection, kidney damage, and diabetes in school children has been approved by the Albemarle County Medical Society, the Charlottesville-

Albemarle County Health Department, the Charlottesville and Albemarle County School Boards, and Dr Samuel D Sturkie of the Charlottesville-Albemarle Health Department The program, to be directed by the department of preventive medicine and the department of urology of the University of Virginia School of Medicine in cooperation with the private physicians of this area, is based on a pilot study carried out last year in over 3 000 Waynesboro school children by Dr Calvin M Kunin, assistant professor of preventive medicine, and Dr Albert J Paquin Jr, professor of urology Both the Waynesboro program and the new program in Charlottesville-Albemarle County are designed to bring infected children to the attention of their physicians for evaluation and treatment The study will include children in all the schools in the Charlottesville-Albemarle County area Eight to ten thousand children are expected to participate No injections are involved in this program, but parental consent must be obtained for each child to participate An educational campaign is planned to begin prior to the actual collection of specimens to enable both parents and children to be fully informed of the value of these free tests

WASHINGTON

State Medical Election —The following officers have been elected by the Washington State Medical Association for 1960 61 president, Dr Homer W Humiston, Tacoma, president-elect, Dr Willard B Rew, Yakima, vice-president, Dr Wendell C Knudson, Seattle, secretary-treasurer, Dr Wilbur E Watson, Seattle, assistant secretary-treasurer, Dr Carl E Mudge, Seattle, speaker of the house, Dr Dean K Crystal, Seattle

WISCONSIN

Allergy Society Meeting in Madison —The first meeting of the Wisconsin Allergy Society was held at the Holiday Inn, in Madison, Oct 15 A scientific program was presented which included papers by Dr Samuel M Feinberg, of Chicago, who discussed repository therapy, Dr Seymour B Crepea, of Madison, who spoke on the pathology of asthma, and Dr John A Arkins, of Milwaukee, who talked about pulmonary function studies in asthma This meeting was followed by a dinner at which Dr Harry R Weil, Milwaukee, president of the society, presented a plaque to Dr Theodore L Squier, of Milwaukee, honoring him for his pioneer efforts in the field of allergy'

GENERAL

Mental Health Meeting in Denver —The 10th annual meeting and mental health assembly of the National Association for Mental Health will be held at the Denver-Hilton Hotel, Denver, Nov 17-19 The following subjects will be covered in the 4 program sessions beginning Thursday afternoon and concluding Saturday morning Psychiatric Services in General Hospitals, Research, Information and Referral Services, and the Mental Health Careers Program The annual banquet Friday evening will feature an address by Dr E Vincent Askey, President of the American Medical Association Mental health film showings will be held on Friday and Saturday mornings For information, write the National Association for Mental Health, 10 Columbus Circle, New York 19

Study to Analyze Hospital Costs —Plans for a major national study of hospital costs have been announced by Prof Walter J McNerney, Ph D, director of the University of Michigan Bureau of Hospital Administration Backed by a grant of more than $126,000 from the Health Information Foundation (420 Lexington Ave, New York, N Y), the study will involve between 10 and 20 general hospitals It will relate the 'input' of personnel, supplies and equipment to the "output" of these hospitals in terms of patient services, education research, and public health programs The study will also analyze relationships between costs, expenditures, and sources of income for the hospitals It will examine how expenditures vary with qualitative factors and how hospital costs compare with broad economic phenomena

National Space Group Announces Appointments — The National Aeronautics and Space Administration on Oct 10 announced appointment of 28 'outstanding scientists" to three Office of Life Science Advisory Committees "The committees give NASA the benefit of the advice and counsel of recognized leaders in the fields of science and technology which make up the life sciences,' said Dr Clark T Randt, Cleveland, director of the Office of Life Sciences Each of the committees is to meet 3 or 4 times a year The committees and their chairmen are Space Biology (molecular biology and cellular environmental physiology, and extraterrestrial life) —Melvin Calvin, D Sc, Professor of Chemistry, University of California, Space Medical and Behavioral Sciences (neurophysiology and psychology, metabolism and nutrition, and cardiovascular and respiratory physiology)—Dr Robert S Morison, Director, Medical and Natural Sciences, The Rockefeller Foundation, Flight Medicine and Biology (experiments in the space environment and biotechnology)—Dr William R Lovelace II, Albuquerque, N M, the Lovelace Foundation

Division of Nursing Established —Surgeon General Leroy E Burney, of the U S Public Health Service, announced establishment of the Division of Nursing within the Bureau of State Services, effective Sept 1 The new division brings together 2 nursing units, the Division of Public Health Nursing from the Bureau of State Services and the Division of Nursing Resources from the Bureau of Medical Services All functions of the 2 former nursing units will be continued in the Division of Nursing, and other functions will be added as developments indicate the need to assume new areas of responsibility Existing expert advisory groups concerned with nursing research and training will continue to advise the surgeon general in these areas The 3 groups are the National Advisory Health Council, the Expert Advisory Committee for the Professional Nurse Traineeship Program, and the National Advisory Committee on Public Health Training The new division will be concerned chiefly with the hospital and public health nursing aspects of community health

Meeting of Missionaries Cites A M A Action—The Medical Advisory Committee of the Commission on Ecumenical Mission and Relations of the United Presbyterian Church in the U S A met at the Hotel Statler in New York City on Sept 25 Mrs Myra Scovel, who, with her husband, was a former missionary in China and India, presented a review of progress made in the "Medical Emphasis Year" program Dr Paul Roads, Chairman of the Medical Advisory Committee, outlined the accomplishments made at the Aug 30 meeting in the A M A headquarters with medical missionaries, and with representatives from the various missionary boards present, including Bishop Sheen, President of the "Society for the Propagation of the Faith" The Medical Committee expressed its gratitude that the A M A had taken official cognizance of the total missionary enterprise Dr George F McInnes, Augusta, Ga, reported on an evaluation of the McCormack Hospital in Chung Mai, Thailand The role of the McCormack Hospital as a possible postgraduate institution was emphasized, Dr McInnes reported that the Thai government was building a new medical school in Chung Mai Dr Bob E Hulit, of Billings, Mont, was welcomed as a new member of the Medical Committee The meeting ended with the showing of "Through These Hands," filmed at the Severance Hospital in Seoul

Meeting on Clinical Research in Chicago—The Central Society for Clinical Research will meet Nov 4-5 at the Drake Hotel, Chicago A total of 36 papers is scheduled for presentation, including the following to be introduced by members

- The Excretion of Citrate in Patients with Renal Tubular Acidosis and Nephrocalcinosis, Dr Robert E Dedmon, Chicago, and Dr Oliver Wrong, London, England
- Nosocomial Urinary Tract Infections Analysis of Factors Influencing the Distribution and Antimicrobial Resistance of Uropathogens, Dr Sidney E Grossberg, Minneapolis, Dr Robert G Petersdorf, Seattle, Dr J A Curtin, Washington, D C, and Dr Ivan L Bennett Jr, Baltimore
- Studies on the "Trigger" Mechanism Involved in the Vascular Alterations Induced by Endotoxia, James Vick, M S, Minneapolis
- Studies of Adipose Tissue and Liver Glycogen in Rats *Limited to a Short Daily Feeding Period*, Dr Guy F Hollifield and Dr William Parson, Charlottesville, Va
- Quantitative Studies of the Effect of Glucose Upon the Release of Fatty Acid by Adipose Tissue, Drs John A Moorhouse, Germain J Roy, Gordon R Grahame, Winnipeg, Manitoba, Canada
- The Concept of a Digestive Surface in the Small Intestine The Cellular Nature of Disaccharide and Phosphate Ester Hydrolysis, Dr David Miller and Robert K Crane, Ph D, St Louis
- Radiocalcium Metabolism in Human Disuse Osteoporosis, Dr Robert P Heaney, Omaha
- Investigations on the Reduction in Adrenal Steroid Hormone Productions by an Inhibitor of Cholesterol Biosyntheses, Dr James C Melby, Marlys St Cyr, B A, and Sidney L Dale, B A, Little Rock, Ark

For information, write Dr Austin S Weisberger, 2065 Adelbert Rd, Cleveland 6, Secretary

Suicide Rated Among Top Ten Causes of Death—Suicide, one of the top 10 causes of death in the U S, is statistically more successful in men, but women try more often, according to Dr Eugene W Kansky, psychiatrist at the University of Michigan Medical Center, who presented statistics on suicide to the Neuropsychiatric Institute Journal Club Every 60 seconds, a human being in the U S tries to end his life, Dr Kansky said—about 20,000 per year succeed Unsuccessful suicide attempts occur largely in young people under 30, but as age increases, these attempts become reality For men over 65 and women 45 to 67, suicide is successful four times as often as in young adulthood Dr Kansky presented these statistics with the warning that they can be misleading and often inaccurate because of oversimplification He emphasized that every suicide must be considered in the light of all factors, especially personality and present adaptation to life, and not just according to age, sex, or other isolated data Age differences distinguish the tone of the suicide note those written by the old-age group often indicate depression and self-recrimination, whereas younger victims choose more malicious, hostile, and wounding mementoes Four white persons destroy themselves for every Negro, statistics show Divorced persons have a high suicide ratio, with the widowed group second highest in incidence Married people, as well as those who never married, have much lower rates Dr Kansky indicated a correlation between religion and suicide Jews commit suicide less frequently than members of any other religion, and Catholics less than Protestants City dwellers find more self-destruction in their ranks than country people In the U S, Dr Kansky said, northwestern and northeastern states lead, Nevada having the highest and Mississippi the lowest rates Spring and summer bring an annual increase in suicide compared with fall and winter

Call for Papers for Annual Meeting in New York City

The Council on Scientific Assembly is presently considering scientific subjects for presentation in the Scientific Assembly at the Annual Meeting of the American Medical Association in New York City, June 26 30, 1961

The lecture program of the Annual Meeting is developed by the secretaries of each of the 21 sections of the Scientific Assembly In order to completely coordinate all scientific programs (lectures, movies, television, and the scientific exhibits), the titles of proposed papers should be submitted to the Section Secretaries not later than Nov 15, 1960

Since the program is in the formative stages, all medical scientists who are considering the presentation of scientific papers before the medical profession at the Annual Meeting should communicate before that date with the Secretary of the Section before which he wishes to present his subject It is emphasized that the completed paper is not required to be ready by Nov 15, 1960 In many instances the material to be presented at the June meeting represents research that is currently being undertaken and cannot be completed until a short time before the meeting

The Scientific Exhibit is arranged by the Council on Scientific Assembly in cooperation with the Representatives from the Sections to the Scientific Exhibit Application blanks for space in the Scientific Exhibit may be obtained from the Section Representative or the Secretary of the Council on Scientific Assembly, American Medical Association, 535 N Dearborn St, Chicago 10 All applications must be submitted by Jan 9, 1961

Application blanks for presentation of films on the motion picture program may be obtained from Mr Ralph Creer, Director, Medical Motion Pictures and Television Department, Communications Division, American Medical Association, 535 N Dearborn St, Chicago 10 The closing date for acceptance of these applications is Jan 9, 1961 Since films are previewed prior to acceptance, applications for time on this program should be made as early as possible

The names and addresses of the Section Secretaries and Representatives to the Scientific Exhibit are as follows

Anesthesiology

Secretary—Vincent J Collins, M D New York University-Bellevue Medical Center, 550 First Avenue, New York 16

Exhibit Representative—Edwin Rushia M D, University Hospital, Augusta, Ga

Dermatology

Secretary—Edward P Cawley M D, University of Virginia Hospital, Charlottesville, Va

Exhibit Representative—Stanley E Huff, M D, 636 Church Street, Evanston, Ill

Diseases of the Chest

Secretary—Coleman B Rabin, M D, 1176 Fifth Avenue, New York 29, N Y

Exhibit Representative—Edwin R Levine, M D, 111 N Wabash Avenue, Chicago 2

Experimental Medicine and Therapeutics

Secretary—Samuel P Martin, M D, University of Florida School of Medicine, Gainesville, Fla

Exhibit Representative—Joseph F Ross M D, Department of Biophysics and Nuclear Medicine, University of California School of Medicine, Los Angeles 24

Gastroenterology and Proctology

Secretary—G Gordon McHardy, M D, 3636 St Charles Avenue, New Orleans 15

Exhibit Representatives—Willard Bernhoft, M D, 2900 Main Street, Buffalo 14 N Y, and Thomas E Machella, M D, 3400 Spruce Street, Philadelphia 4

General Practice

Secretary—Eugene I Baumgartner, M D, 25 Alder Street, Oakland, Maryland

Exhibit Representative—I Phillips Frohman, M D, 2924 Nichols Avenue, S E Washington 20, D C

Internal Medicine

Secretary—Wright R Adams, M D, 950 E 59th Street, Chicago 37, Illinois

Exhibit Representative—Richard V Ebert, M D, University of Arkansas School of Medicine, Little Rock, Ark

Laryngology, Otology and Rhinology

Secretary—Walter E Heck, M D, Suite 103, 3905 Sacramento Street, San Francisco 18

Exhibit Representative—Walter H Maloney, M D, Temple University Medical Center, 3400 N Broad Street, Philadelphia 40

Military Medicine

Secretary—James T McGibony, M D (Col, MC, USA) Medical Plans and Operations Division, Office of The Surgeon General, Department of the Army, Washington 25, D C

Exhibit Representative—Joe M Blumberg, M D (Col, MC, USA), Armed Forces Institute of Pathology, Washington 25, D C

Nervous and Mental Diseases

Secretary—Howard P Rome, M D, 200 First Street, S W, Rochester, Minnesota

Exhibit Representative—Benjamin Boshes, M D Northwestern University Medical School, 303 East Chicago Avenue, Chicago 11

Obstetrics and Gynecology

Secretary—Robert H Barter M D, 901 23rd Street N W, Washington 7, D C

Exhibit Representative—Frederick H Falls, M D, P O Box 47, River Forest, Ill

Ophthalmology

Secretary—Henry F Allen, M D, 200 Beacon Street, Boston 16, Massachusetts

Exhibit Representative—Frank W Newell M D, 950 East 59th Street, Chicago 37

Orthopedic Surgery

Secretary—Robert J Joplin, M D, 1180 Beacon Street, Brookline 46, Mass

Exhibit Representative—E Burke Evans, M D, 815 Avenue C, Galveston, Texas

Pathology and Physiology

Secretary—Hugh A Edmondson, M D, 1200 N State Street, Los Angeles 33

Exhibit Representative—Samuel A Levinson, M D, L A Weiss Memorial Hospital, 4646 N Marine Drive, Chicago 40

Pediatrics

Secretary—Arild E Hansen, M D, Children's Hospital of the East Bay, 5100 Grove Street, Oakland 9, Calif

Exhibit Representative—F Thomas Mitchell, M D, LeBonheur Children's Hospital, 848 Adams at Dunlap, Memphis 5, Tenn

Physical Medicine

Secretary—Earl C Elkins, M D, 200 First Street, S W, Rochester, Minn

Exhibit Representative—Ralph E Worden, M D, University of California Medical Center, Los Angeles 24

Preventive Medicine

Secretary—Lemuel C McGee, M D, Hercules Tower, 910 Market Street, Wilmington 99, Del

Exhibit Representative—Paul A Davis, M D, 633 E Market Street, Akron 4, Ohio

Radiology

Secretary—Clyde A Stevenson, M D, Sacred Heart Hospital, West 101 Eighth Avenue, Spokane 4, Wash

Exhibit Representative—Richard H Chamberlain, M D, 3400 Spruce Street, Philadelphia 4

General Surgery

Secretary—E H Ellison, M D, 8700 W Wisconsin Avenue, Milwaukee 13

Exhibit Representative—Julian Johnson, M D, 3400 Spruce Street, Philadelphia 4

Urology

Secretary—Edward H Ray, M D, 2101 Nicholasville Road, Lexington, Ky

Exhibit Representative—Eugene F Poutasse, M D, Cleveland Clinic, 2020 East 93rd Street, Cleveland

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology *Written* Various locations, June 30 *Oral* Kansas City, Apr 17-22 Sec, Dr Forrest E Leffingwell, 217 Farmington Ave, Hartford 5, Conn

American Board of Dermatology Final date for filing applications of candidates completing training by October 15, 1960 is March 1, 1961 *Written* Several cities, June 5, 1961 *Oral* Philadelphia, Oct 13-16, 1961 Sec, Dr Maurice J Costello, One Haven Avenue, New York 32, New York

American Board of Internal Medicine New York City, Nov 14-17 Closing date for filing application was July 1 Schedule for 1961 *Written Examination* October 16 *Oral Examinations* New Orleans, Jan 30-Feb 2, Chicago, April 4-7, Los Angeles, Sept 26-29, New York City, Nov 7-10 Closing date for acceptance of applications for the January and April examinations was October 1, 1960, and for the September and November examinations is June 1, 1961 Sec-Treas, Dr William A Werrell, One West Main St, Madison 3, Wis

American Board of Neurological Surgery *Oral* New Haven, Nov 13-16 Final date for filing application is Sept 1 Sec, Dr Donald D Matson, 300 Longwood Ave, Boston 15

American Board of Obstetrics and Gynecology *Written* Various cities of the United States, Canada, and military centers outside of continental United States, January 13 *Oral* Chicago, Apr 7-14 Application for certification, new and reopened in Part I, and requests for reexamination in Part II are now being accepted Deadline for receipt of applications for the written examination was August 1 Candidates submitting applications in 1960 for the 1961 examinations are not required to submit case reports as previously required to complete the Part I examination In lieu of this requirement, new condidates are required to keep in their files a duplicate list of hospital admissions as submitted with their application, for submittal at the annual meeting in Chicago should they become eligible to take the Part II (oral) examination Reopened candidates will be required to submit case reports for review thirty days after notification of eligibility Exec Sec, Dr Robert L Faulkner, 2105 Adelbert Road, Cleveland 6

American Board of Ophthalmology *Written* Jan 23, 1961 Deadline for filing applications was July 1 Sec, Dr Merrill J King, Box 236 Cape Cottage Branch, Portland, Maine

American Board of Orthopaedic Surgery *Written and Oral, Part I* Palo Alto, Calif, Nashville, Tenn, Philadelphia, June 19-20 Final date for filing application is Jan 1 *Written and Oral, Part II* Miami Beach, Jan 4-6 Final date for filing application was July 1 Sec, Dr Sam W Banks, 29 E Madison St, Chicago 2

American Board of Pediatrics *Written* New York City, January Final date for filing application is Dec 1 Sec, Dr John McK Mitchell, 6 Cushman Road, Rosemont, Pa

American Board of Physical Medicine *Parts I and II* New York City, June 24-25 Final date for filing application is Feb 15 Sec, Dr Earl C Elkins, 102 Second Ave, S W, Rochester, Minn

American Board of Plastic Surgery Entire examination—*written*, and *oral* and *practical* given in May of each year *Final date for submitting case reports is January 1* Next examination to be given in New York City, May 14-16 Corres Sec, Mrs Estelle E Hillerich, 4647 Pershing Ave, St Louis 8, Mo

American Board of Psychiatry and Neurology New York, New York, Dec 12-13, New Orleans, Mar 20-21, and Chicago, Oct 9-10, 1961 Sec, David A Boyd, Jr, 102-110 Second Ave, S W, Rochester, Minn

American Board of Radiology *Examination* Cincinnati, Dec 10-13 Deadline for filing applications for the June examination was Jan 1 Filing deadline for the December examination was July 1 A special examination in Nuclear Medicine (for those diplomates in Radiology or Therapeutic Radiology) will be offered provided there are sufficient applications Sec, Dr H Dabney Kerr, Kahler Hotel Bldg, Rochester, Minn

American Board of Surgery *Written* (Part I), Various Centers, Dec 7 *Candidates are urged to apply several months before completion of training requirements* The closing date for filing applications was August 1 Those completing training requirements after September 30 cannot be considered for the December Part I examination of the same year *Oral* (Part II)—Buffalo, Nov 14-16, Nashville, Dec 12-13, Philadelphia, Jan 16-17, Houston, Feb 13-14, Columbus, Ohio, Mar 13-14, New York City, April 19-20, Portland, Ore, May 15-16, San Francisco, May 18-19 Sec-Treas, Dr John B Flick, 1617 Pennsylvania Blvd, Philadelphia 3

Board of Thoracic Surgery - *Written* Various centers throughout the country, Feb 10 Final date for filing application is Dec 1 *Oral* April 1961 Final date for filing application is Dec 1

American Board of Urology *Written* December *Oral Clinical* Chicago, February 1961 Exec Sec, Mrs Ruby L Griggs, 30 Westwood Road, Minneapolis 26

[illegible] relieves the tension and anxiety that contribute to hypertension—but without causing appreciable apathy or inertia. It leaves the patient capable of continuing normal activities

[illegible] has been shown[1] to be highly effective with fewer side effects than many other agents commonly used to control everyday nervousness, apprehension, tenseness and anxiety

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[1] Batterman R C Grossman, A J Mouratoff G J and Leifer P A Clinical Re-evaluation of Daytime Sedatives, Scientific Exhibit, Annual AMA Meeting San Francisco, Cal June 23 27, 1958

MEETINGS

American Medical Association Dr F J L Blasingame, 535 North Dearborn St, Chicago 10, Executive Vice-President

1960 Clinical Meeting, Washington, D C, Nov 28-Dec 1
1961 Annual Meeting, New York City, June 26-30
1961 Clinical Meeting, Denver, Nov 27-30
1962 Annual Meeting, Chicago, June 11-15
1962 Clinical Meeting, Los Angeles, Nov 26-29
1963 Annual Meeting, Atlantic City

AMERICAN

1960

November

American College of Chest Physicians Shoreham Hotel, Washington D C Nov 26-27 Mr Murray Kornfeld, 112 E Chestnut St, Chicago 11, Executive Director

American Medical Writers Association Hotel Morrison Chicago, Nov 18-19 Dr Harold Swanberg 510 Maine St, Quincy Ill, Secretary

American Society of Tropical Medicine and Hygiene, Biltmore Hotel, Los Angeles, Nov 2-5 Dr Rolla B Hill, 3575 St Gaudens Rd, Miami 33, Fla, Executive Secretary

Association of Clinical Scientists, Shoreham Hotel, Washington D C (*Applied Seminar on Measurements of Pancreatic Function in Clinical* Medicine, Nov 4-5 Dr F William Sunderman, 1025 *Walnut St*, Philadelphia 7), Annual Meeting, Nov 6 Dr Robert P MacFate, 54 W Hubbard St, Chicago 10 Secretary

Central Society for Clinical Research *Drake Hotel* Chicago, *Nov* 4-5 Dr Austin S Weisberger, 2065 Adelbert Rd, Cleveland 6, *Secretary*

Pacific Coast Fertility Society, Hotel Tropicana Las Vegas, Nev, Nov 10-13 Dr Anah C Wineberg 3120 Webster St, Oakland, Calif, Secretary-Treasurer

Puerto Rico Medical Association, *Santurce, Nov 15-19 Mr Jesus A* Sanchez P O Box 9111 Santurce 29, P R, Executive Secretary

Southern Thoracic Surgical Association British Colonial Hotel, Nassau, *Bahamas, Nov 17-20 For information write Dr Hawley H* Seiler, 517 Bayshore Blvd Tampa 6, Fla, Secretary

December

Academy of Psychoanalysis, Hotel Biltmore New York Dec 10-11 Dr *Joseph H Merin* 125 E 65th St, New York 21, Secretary

American Academy of Dermatology and Syphilology, *Palmer House*, Chicago, Dec 3-8 Dr Robert R *Kierland, First National* Bank Bldg, Rochester, Minn *Secretary*-Treasurer

American Rheumatism Association Sheraton Dallas Hotel, Dallas Texas, Dec 9 Mr Gerard W Speyer, 10 Columbus Circle New York 19 Executive Secretary

Conference on Graduate Medical Education— Educational Problems in the Internship and Residency, University of Pennsylvania Graduate School of Medicine Dec 1-2 For information write Dr Paul Nemir Jr 237 Medical Laboratories Bldg, Philadelphia 4 Dean

New York Heart Association Symposium on the Myocardium, Its Biophysics and Biochemistry, Waldorf-Astoria Hotel New York City, Dec 9-10 For information write Dr Alfred P Fishman, N Y Heart Ass n, 10 Columbus Circle New York 19

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Critical Appraisal of Sulfonylurea Therapy of Diabetes Mellitus

Samuel B Beaser, M D, Boston

The substitution of sulfonylurea drugs in the treatment of diabetes demands even more careful observation of the patient than may be required with the use of insulin. It is especially important to recognize that patients tend to regard a disorder, even diabetes, as minor when oral medication is employed, and omission of the drug may be looked upon as relatively unimportant. With the use of the sulfonylurea drugs the dynamic qualities of the diabetes should be appreciated, also an intimate knowledge of the pharmacology. It is emphasized that the sulfonylurea drugs have a maximum of effectiveness. Accordingly, a higher dosage beyond a given limit does not increase their value. Thoughtful cooperation of the patient as to diet and medication is essential.

THE INTRODUCTION of sulfonylurea therapy in human diabetes in the past five years has stimulated research, given thousands of diabetic patients the convenience of oral therapy, and evoked the hope of eventual replacement of insulin for the remainder. In clinical practice in the United States at present, tolbutamide (Orinase) and chlorpropamide (Diabinese) are the only sulfonylurea drugs in general use. These drugs represent a real advance in therapy. However, there remain unanswered questions about the mechanism of their action and the eventual course of diabetes treated by these agents. There has been a tendency to overemphasize these questions at the expense of more practical problems which concern the clinical application of these drugs, and which have assumed increasing importance as the use of these drugs has become more widespread.

These problems are at the level of medical techniques and of patient education. The former involve a knowledge of the pharmacological differences between the actions of insulin and of sulfonylurea and appreciation by the average physician of the dynamic qualities of human diabetes mellitus.

Clinical Associate in Medicine Harvard Medical School and Consultant Abraham Rudy Diabetes Clinic Medical Service Beth Israel Hospital

Differences from Insulin

A continuous increase in hypoglycemic action of insulin can usually be expected with increasing doses of insulin Moreover, except for rare instances of insulin allergy or resistance, interruption or loss of effectiveness of insulin therapy need never be anticipated

In contrast to insulin, the sulfonylurea drugs have a maximum limit to their action Increase in the dose above this limit does not increase the action (2 0 to 3 0 Gm for tolbutamide and 500 mg for chlorpropamide) Moreover, they do not act in all diabetic patients They require a minimum of about 30% of the normal beta-cell function of the pancreas to exert a clinical effect in human diabetes[1] In diabetic patients with severely depleted islet function these drugs can even worsen the diabetes Finally, unlike insulin, these drugs are subject not only to immediate failure but also to delayed and unexpected failure at a later date, usually after 6 to 12 months of therapy

Physiological Bases of Therapy—The average adult diabetic patient has the pancreatic beta-cell function reduced to about 50% of normal, although the obese patients with milder disease may have much more function left The pharmacological reserve of these sulfonylurea drugs may be estimated as the difference between that of the 30% minimum beta-cell function they require to work and the average of 50% present in the maturity-onset diabetic patients for whom they are found useful In addition, this reserve is subject to further reduction, either acutely with stress or chronically as a function of time Finally, as with insulin, regulation with these drugs depends on adequate adherence to a diabetic diet Increases in diet and weight can theoretically be handled ad infinitum with insulin, by contrast, the average sulfonylurea-treated patient is severely limited in the reserve available for such liberties

The study of large numbers of diabetic patients over the past two decades has led to the conclusion that diabetes is a progressive disease This is difficult to delineate clearly in patients treated permissively My policy of treating the disease with normoglycemia as the aim has facilitated such observations

This increase in severity of the diabetes is sometimes gradual but more often stepwise It may follow the specific stress of complicating disease (such as infection or myocardial infarction) or an increase in diet or weight Frequently it may appear spontaneously and unpredictably The problem of the progressiveness of diabetes confronts the patient whether treated with insulin or one of the sulfonylurea drugs Thus, treatment with the latter should be regarded as intermediate between treatment with diet alone and with insulin, for an indeterminate percentage of such patients To be sure, the period of sulfonylurea treatment may prove to be many years in duration, but the possibility of progressiveness of the diabetic process must always be borne in mind

Selection of Patients

Given the background of the present knowledge, the changeover to the use of the sulfonylurea drugs should be attended by even more careful observation of the patient by the physician than insulin therapy This should include at least equal attention to initial regulation, diet, and subsequent follow-up

That this has not been the case has become evident with the passage of time The patients tend to regard a disorder which can be treated by oral medication as a minor one And physicians, deluded by the ease with which overweight diabetic patients with a mild form of the disease have yielded to such therapy even with careless dietary observation, have done little to disabuse the patients of this idea As a result, difficulties have begun to arise which are unfortunate and yet are entirely preventable

The need for critical selection of the patients for sulfonylurea therapy, unlike the case with insulin, should be apparent from the facts In the juvenile diabetic or the adult patient with severe diabetes disastrous consequences taught doctors to be cautious of replacing insulin completely or abruptly by these drugs Other adult diabetic patients, especially those with a tendency to lability, should be classified in the same category, even though the insulin requirement may not be high The oral tolbutamide response test can predict with accuracy the results of therapy only in this group of patients and can therefore be used for this purpose[2] [3] For other purposes its usefulness is quite limited Actually, if insulin is stopped for one day and severe hyperglycemia (fasting blood sugar level of 300 mg %) or ketonuria ensues, the sulfonylurea therapy will probably prove ineffective

In point of fact, the important problem of selection involves the patient with disease of intermediate severity, with actual insulin requirements of over 10 units per day The criteria usually given for prediction of success with the sulfonylurea drugs are patients over the age of 40, with under 10 years of diabetes, with lack of previous acidosis, and an insulin requirement of under 40 units These criteria have shown limitations and surprising contradictions Patients with insulin requirements of only 8 units have failed to be regulated and patients requiring 60 units have succeeded with the sulfonylurea drugs As a practical example of the need for careful appraisal, it must be emphasized that it is the insulin dose needed to secure a reasonably good blood sugar level (i e, under 180 mg %, by the Folin-Wu method, one hour after breakfast) that is referred to as the insulin requirement The estimate of insulin dose required with careless regulation may be as much as 40 units below this figure, and such an appraisal holds out only an empty promise of success The careless evaluation of this factor can lead to weeks of fruitless attempt to regulate a patient in actual practice

Thus, it must be recognized that each patient started on sulfonylurea therapy represents only an experimental trial If this point of view is emphasized to each new patient, he will be psychologically prepared for the possibility of pharmacological failure and the consequent need for insulin The old insulin patient being tried on oral therapy requires similar orientation This possibility of failure distinguishes the sulfonylurea drugs from insulin In addition, the dependence upon diet of both the initial and continued success of therapy must be a cornerstone of the patient's initial education

Response to Therapy

There is still another physiological phenomenon to be reckoned with The new, untreated diabetic shows a certain degree of resistance to therapy with insulin The mechanism of this manifestation is not entirely clear, but may in part be humoral [4, 5] or hepatic [6] When therapy is started with insulin, this can be measured by an initially higher level of insulin requirement for several days to weeks, followed by a subsequent decrease to a lower level This "inertia" is present with sulfonylurea therapy too However, since insulin dosage can be elevated indefinitely with increasing effect, insulin can eventually overcome this and normoglycemia eventually be attained Sulfonylurea drugs, on the other hand, have a maximum limit to their effectiveness, and this may be entirely spent in overcoming this initial resistance without achieving success This failure may be needless in many cases In the patients with more severe diabetes for example, it would be preferable to regulate with insulin for the initial period (of about three to four weeks) and then to treat with the sulfonylurea drug This procedure would turn unnecessary failure into success in some of these more severely affected patients Moreover, it is actually sound medical policy for each new patient to learn insulin administration Otherwise, an intercurrent illness of sufficient severity to worsen the diabetes beyond the limited reserve of these orally given drugs would require hospitalization

In the immediate period after onset of therapy the patient should perform a daily urine test and receive a weekly blood sugar test These are most valuable when performed postprandially, two hours for the urine and one for the blood Such determinations present the real challenge to these drugs, since fasting tests are much more readily rendered normal This immediate follow-up period may be prolonged up to six or eight weeks for full action to take place and to avoid a premature decision

However, this should be continued only so long as a decisive downward trend in blood sugar level is discerned If the postprandial blood sugar level does not drop below 250 to 300 mg% (Folin-Wu) by the end of four weeks, it indicates that a critical therapeutic deficit exists This may represent a steady state in the patient with milder diabetes In the more severely ill patient, however, this deficit frequently continues to widen, with the inevitable increase in the blood sugar levels and metabolic decompensation in weeks to months This may be erroneously labeled as a "secondary failure," when actually the patient had never been satisfactorily stabilized By contrast, if an insulin-treated patient is deliberately undertreated by a certain percentage of his insulin requirement, the blood sugar level rises to a certain degree and usually remains there, at least for a while, as a steady state of affairs This difference between the two drugs in treatment of the patient with moderately severe diabetes has not hitherto been emphasized An unfortunate corollary is the lack of warning symptoms during this period of moderate hyperglycemia If, then, urine and blood sugar tests are not performed in this initial period, months of intense hyperglycemia can follow until symptoms finally do ensue

In addition to the probability of metabolic decompensation, the hyperglycemia of such a therapeutic deficit may act as a stress to decrease the already limited beta-cell reserve of the pancreas Worsening of diabetes has been described as a result of induced alimentary hyperglycemia in experimentally produced diabetes (with alloxan or by surgery) There have likewise been isolated case reports of an increase in eventual insulin requirement when sulfonylurea therapy has been persistently administered in the face of treatment failure [7] There is no good evidence that this type of effect occurs with any significant frequency in diabetic patients who respond properly to the sulfonylurea drugs, or in patients promptly reverted to insulin when treatment failure becomes apparent This loss of valuable pancreatic reserve as a result of deficient medical follow-up in this initial treatment phase is therefore unnecessary Again, what is required is merely to continue to use the routine follow-up already familiar to all physicians in the ambulatory treatment of a diabetic with insulin

Further Responsibilities of Physicians

There are admitted difficulties in persuading an asymptomatic diabetic patient to return to insulin simply because the blood sugar level of 300 mg% after three weeks predicts inevitable treatment failure and symptoms However, proper initial indoctrination could forestall much of this difficulty, and this is actually no different a responsibility than the one previously assumed in initiating insulin therapy in a patient for whom dietary therapy alone proved inadequate

After the period of initial regulation is over, proper long-term follow-up of the sulfonylurea-treated diabetic patient is even more important than with the insulin-treated patient The limited reserve action of these drugs is inadequate to cope with the only too frequent dietary infractions, the almost inevitable progress of the disease, and the occasional but important delayed failure of the drug If the patient is made to understand this, he can easily be persuaded to accept this modicum of inconvenience in exchange for the greater convenience of oral therapy However, as in all patient education, the impetus must come from a physician properly aware of medical indications and properly motivated to implement them [8]

The pharmaceutical companies have made more than adequate efforts to supply both patients and physicians with detailed product information However, their proper application presupposes a good basic understanding of diabetes mellitus implemented by a proper program of therapy While it is still true that there is some difference of opinion as to what degree of normoglycemia is necessary in the treatment of diabetes mellitus, most physicians with special interest in diabetes mellitus aim for aglycosuria as a minimum goal [9] Unfortunately, when confronted with the need to accept insulin therapy after failure of the sulfonylureas, too many patients are insisting on continuing for "a little while longer" with hyperglycemia of considerable degree In effect, the standard of therapy of diabetes is in danger of being changed by the patients themselves on non-medical grounds This would be unacceptable in other diseases and can eventually only lead to deleterious effects upon the patients with this one, if it is allowed to continue

Summary

After five years of experience with the use of the sulfonylurea drugs in the treatment of diabetes mellitus, it has become clear that they are more rather than less complex to use than insulin Moreover, as in the case of many valuable drugs, their improper administration can act to the detriment of the patients Their proper use requires a recognition of the dynamic qualities of the disease, an intimate knowledge of the pharmacology of these drugs, and the continued observation and cooperation of the patients

31 Bay State Rd (15)

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FOUNDER OF THE ROYAL COLLEGE OF PHYSICIANS—"Linacre was successively Physician to Henry the Seventh, Henry the Eighth, Edward the Sixth, and to the Princess Mary He established lectures on physic in both Universities, and he was the founder of our Royal College of Physicians, of which he was the first President, holding that office during the last seven years of his life He was indeed," said Mead, "a most accomplished scholar the Latin style of Linacre is so pure and elegant as to rank him amongst the finest writers of his age, his friend Erasmus saying of him that he was 'vir non exacti tantum sed severi judicii' —Though the medical writings of Linacre are only translations, yet we cannot but form a favourable opinion of his professional skill, not only from the general estimation of his contemporaries, but from the sagacity of his prognosis in the case of his friend Lily the celebrated grammarian, as well as from the rational simplicity of the method by which he relieved Erasmus in a painful fit of the gravel"—The Gold-Headed Cane, London, J Murray, 1828

Bagassosis

Peculiarities of Its Geographical Pattern and Report of The First Case from Peru and Puerto Rico

Howard A Buechner, M D , New Orleans

Bagassosis is an occupational disease resulting from the inhalation of dust from dried sugar cane fiber, or bagasse, which has become an important industrial material The fresh fiber is apparently innocuous and illness follows contact only with old bagasse which has been baled and allowed to dry This fact evidently accounts for peculiarities of the distribution of the disorder The disease has been absent from most of the great cane growing areas of the world, but has recently appeared at a newly established paper mill in Puerto Rico where approximately 80 cases have been observed The first of these cases is described The patient, a caucasoid male, 47 years of age, had suffered a prior episode of bagassosis while employed in a similar paper mill in Peru

THE inhalation of dust from dried sugar cane fiber, or bagasse, may result in a specific respiratory illness which has come to be known as bagassosis Although more than 20 years have elapsed since the disorder was first recognized by Blitz and Monte[1] in 1937, and it is associated with important industries such as the manufacture of paper and wallboard, a surprising deficit still exists in our knowledge of its characteristics The many unanswered questions pertaining to the etiology, abnormal pulmonary physiology, pathology, and sequelae of bagassosis have been discussed in previous publications,[2] and the puzzling aspects of its geographical pattern have been pointed out It is with the latter subject that this report specifically concerns itself

Almost simultaneously with the recognition of bagassosis in Louisiana, it was appreciated by Blitz and his associates[1a] that the disease followed an odd distribution among the factories where contact with bagasse occurred Although approximately 60 sugar mills are seasonally engaged in cane grinding operations and bagasse production within a relatively small area of the southern part of the state, only two of these factories and two manufacturing plants to which they supply bagasse are known to be, or to have been, the source of bagassosis This observation was puzzling to the original observers of the disease and has defied explanation to the present time

The two sugar factories in question are located near the small town of Raceland, La , about 40 miles southwest of New Orleans One of the manufacturing plants, a paper mill, is also located in this area while the other plant, which produces wallboard from bagasse, is in the immediate vicinity of New Orleans (fig 1)

It is difficult to explain the peculiarities of the geographical pattern of bagassosis in Louisiana without a detailed study of the methods of handling bagasse in each of the factories in which cane is ground and sugar produced Although a study of this type has never been carried out, certain observations pertaining to occupational exposure to bagasse appear to be of importance Most of the cases of bagassosis with which the author is familiar have occurred in manufacturing plants, particularly among workers who were engaged in breaking bales of old, dried bagasse or who somehow had contact with the area where this work was being carried out This has been true of many Louisiana patients as well as the cases observed by Castelden and Hamilton-Paterson[3] and Hunter and Perry[4] in England, Lemone and associates[5] in Missouri, McDaniel and Hull[6] in Texas, Ganguly and Pal,[7] and Singh[8] in India, and, more recently, in an outbreak of the disease in Puerto Rico[1c]

Few, if any, cases have resulted from contact with moisture-laden bagasse immediately after it is produced by the cane-grinding operation, or from exposure to the freshly baled material It is only after the baled bagasse has been stored outdoors and allowed to undergo thorough dehydration, and perhaps degradation from the effects of

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Chief Medical Service Veterans Administration hospitals and Associate Professor of Clinical Medicine the Tulane University of Louisiana School of Medicine heat and exposure, that it apparently becomes capable of producing disease.

Herein lies the probable explanation of the distribution of bagassosis in the sugar factories of Louisiana. Namely, those factories where the disease has occurred have rehandled old, stored bagasse while the majority of the plants have confined their operation to bagasse production and baling of the fresh, still-wet material, having little contact with the fiber after it has been allowed to dry. They have, thus, had no difficulty with bagassosis.

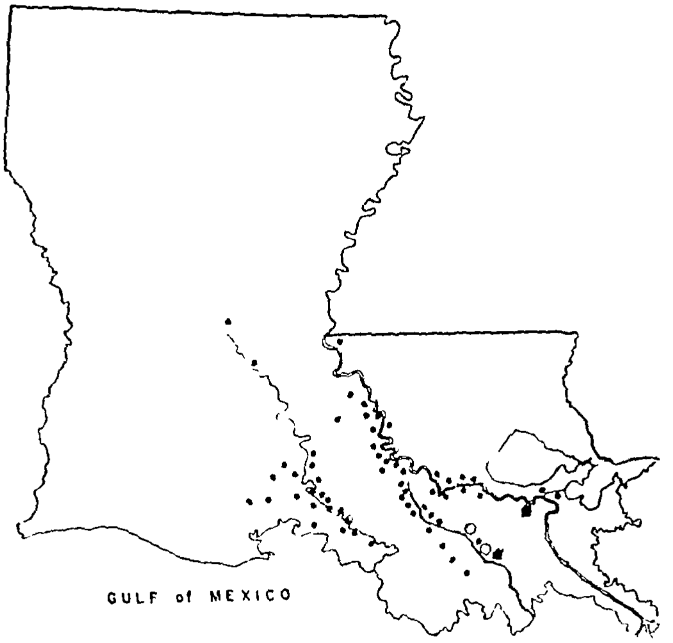

Fig 1.—Map of Louisiana sugar district.

⊙ Sugar factories in which cases of bagassosis have occurred

● Sugar factories (no bagassosis)

■ Manufacturing plants using bagasse from various sources in which cases of bagassosis have occurred

While this premise may not completely explain the geographical distribution of the disorder, since some sugar factories have apparently rehandled stored bagasse without ill-effect, it is the best answer to the puzzle which can be supplied at the present time.

The world-wide distribution of bagassosis has also been difficult to interpret. As has been stated, the disease was first recognized in 1937, long after bagasse was first utilized for manufacturing purposes. It was originally described in 1941,[6] and for the next decade all known cases occurred either in Louisiana or in other states and one foreign country where imported Louisiana bagasse was being utilized (Missouri, Texas, and England). Because of this observation, it at first appeared that some peculiarity of Louisiana bagasse was responsible for the illness. Cangini's[10] report from Italy in 1951, which described five cases of bagassosis resulting from contact with sorghum bagasse, escaped general attention, and it was not until 1955 when Ganguly and Pal[7] and Singh[8] reported 13 cases from India that it became clear that bagassosis must represent a potential world-wide hazard wherever sugar cane is grown and bagasse is utilized.

But if the disease were not limited to contact with Louisiana-produced bagasse, then it seemed strange that it had not been reported from more of the great cane-growing areas of the world, such as Cuba, Argentina, Hawaii, the Philippines, and Puerto Rico. Clearkin[11] in British Guiana (1943) noted a high incidence of respiratory disorders, especially asthma, among cane mill workers during the grinding season, but he described no definite case of bagassosis. Manas,[12] writing from Cuba in 1945, has been erroneously credited with reporting the disease in that country,[5] but he was merely calling attention to its characteristics and possible appearance, since sugar cane is grown extensively there. In like manner, Boccia[13] (in 1951) emphasized the potential occurrence of bagassosis in Argentina, but he had not observed the disease, nor have subsequent cases been reported from this area. A more recent report from Venezuela (Salfelder, 1956[14]) describes a case of suspected bagassosis, but the conditions of exposure are questionable and certain pathological features of the illness indicate that the patient may well have suffered from some other disorder.

So the mysterious absence of bagassosis in these areas has persisted, but now it seems that the puzzle is beginning to unravel. In May, 1959, a new manufacturing plant, which produces paper from bagasse, began operation in Arecibo, Puerto Rico. Within a week, cases of bagassosis began to appear and by December, 1959, approximately 80 workmen had developed the disease.[16] (Most of these cases will be reported in separate publications by Dr José G Molinari, Dr Hiram Vasquez-Milan, Dr Natalio Bayonet, and their co-workers in Puerto Rico.[15]) Interestingly enough, all of the patients had contact with the area where bales of stored, dried bagasse were being broken.

Thus bagassosis is now known to have resulted from contact with bagasse produced in the United States, Italy, India, and Puerto Rico, and there is reason to believe that the disease has also occurred in other cane-producing areas but has gone unrecognized or unpublicized. That the condition is difficult to recognize is attested by personal observation of Louisiana cases and is further borne out by conversations with Puerto Rican physicians who observed the recent outbreak of bagassosis in that country. Having had no previous experience with this disorder, they quite naturally attributed the earliest cases to "pneumonia," and it was not until a considerable number of workmen from the same plant had become ill, that the true nature of the malady was suspected. Even then, the correct diagnosis was not readily accepted by some of the observers while others began to recall occasional similar cases which had been seen in the past and escaped specific diagnosis

There is also the possibility that the disease has been recognized in some countries but has not been reported Because it is an occupational illness and certain economic factors are involved, an understandable but not excusable reluctance to publicize the disorder may exist in certain areas

The following case report appears to be of particular interest and importance, since the patient represents the first recognized instance of apparent bagassosis resulting from exposure to Peruvian bagasse and is also the first of the series of approximately 80 workmen who developed the disease in Puerto Rico

Report of a Case

History—A 47-year-old white male mechanical engineer, had worked for 19 years in a paper mill which used flax as raw material During this entire period he had never experienced respiratory symptoms of any type

In September, 1958, he accepted an assignment which required that he travel to Paramonga, Peru, to study the operation of a factory which produced paper from bagasse After working at this plant for about two months, he had occasion to be exposed to heavy concentrations of dust from dry, stored bagasse in an area where a bale-breaking operation was carried out He had been in contact with the dust for about three hours daily during a period of one week, when he developed a severe cough, productive of increasing amounts of dark, mucoid sputum The black, or dark gray, color of the sputum suggested to the patient that a large amount of bagasse dust was present in the material After another week, he began to complain of moderate dyspnea associated with pain in his right lower anterior chest, which was aggravated by coughing and deep inspiration Other symptoms included marked weakness, nausea, diminished appetite, rapid loss of weight (12 pounds), and chilly sensations on one occasion

He was hospitalized for one week but received no treatment other than bed rest and intravenously given fluids A roentgenogram of the chest was not taken, and no specific diagnosis was established During the period of hospitalization, all symptoms subsided The patient apparently made a complete recovery, rapidly regaining the weight which he had lost He then returned to the United States, where he consulted his private physician and was assured that his recent illness had not been serious A short time afterwards, on Dec 15, 1958, he proceeded to Arecibo, Puerto Rico, to begin his next assignment as superintendent of a new factory which was intended to manufacture paper from bagasse by the same method used in the Peruvian plant

From Jan 15, 1959, to May 22, 1959, the patient and about 115 other workers were engaged in baling operations handling fresh bagasse, with an estimated 50% moisture content, as it was brought directly into the paper factory by conveyor belt from an adjacent sugar mill No respiratory disorders occurred among the workers during this period

On May 22, 1959, the actual manufacture of paper was started, with the bagasse which had previously been baled, stored outdoors for four months, and allowed to dry The patient's duties then required that he spend most of his time in the bale-breaking area supervising an untrained crew, and he was again exposed to very heavy concentrations of bagasse dust Seven days later, on May 28, 1959, he began to complain of lassitude, weakness, moderately productive cough, increasing dyspnea, and diffuse anterior chest pain He also noted nausea, reduced appetite, and a rapid weight loss of 35 pounds (his total weight went from 200 pounds to 165 pounds)

A roentgenogram of the chest at this time disclosed an infiltration in the right upper lobe and a diagnosis of pulmonary tuberculosis was considered The patient was placed at bed rest, and therapy with streptomycin, 1 Gm twice weekly, and isoniazid (INH) was started His symptoms rapidly subsided, he began to regain weight and returned to work after about one week Thereafter he restricted himself to office duties in an air-conditioned building apart from the paper mill, thus avoiding all contact with bagasse dust He felt well and had no further difficulty until early October, 1959, when he again began to frequent the bale-breaking area On Oct 10, 1959, after contact with some particularly foul-smelling bagasse, he become nauseated and experienced the onset of sudden dyspnea which progressed in severity until the patient was unable to ascend 10 stair steps without resting Other symptoms included profound weakness, faintness on exertion, and a severe cough productive of one cupful of mucopurulent sputum daily On one occasion, the sputum contained a small amount of fresh blood Cough, sputum production, and dyspnea were so severe that the patient was unable to lie on his back He also noted feverish sensations, diffuse pain and constriction in the anterior chest, profuse drenching night sweats, cramps in his lower legs, low back pain, anorexia, and weight loss of 20 pounds

On Oct 15, 1959, streptomycin and INH were discontinued (after about four months) because the patient felt these agents were not beneficial and were possibly aggravating his symptoms

Roentgenographic examination of the chest on Oct 27, 1959, (fig 2) disclosed diffuse, mottled densities throughout both lungs The patient's symptoms remained unimproved, and since this represented his third and most prolonged and severe period of illness following contact with bagasse dust, he was referred to the United States for further evaluation

On Nov. 1, 1959, the patient began to notice gradual symptomatic improvement, but when first seen by the author on Nov. 3, 1959, he still complained of moderate dyspnea on exertion, easy fatigue, generalized weakness, poor appetite, mild anterior chest discomfort, and moderate cough, productive of variable amounts of mucopurulent sputum. Night sweats, fever, faintness, leg cramps, and back pain had virtually disappeared.

During the period since the onset of the patient's first illness in Puerto Rico, approximately 80 of his fellow workers had developed similar illnesses and many of them had been demonstrated to have the typical clinical and roentgenographic findings of bagassosis. All of these patients had either worked in or had contact with the bale-breaking area.

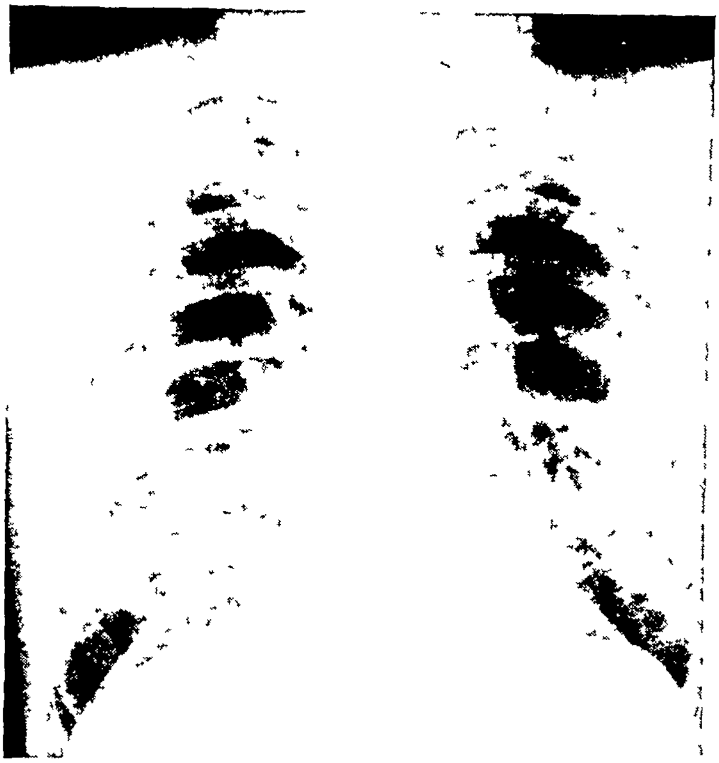

Fig. 2.—Roentgenogram of chest, taken on Oct. 27, 1959, at height of patient's third and most severe episode of bagassosis. Although difficult to visualize in reproduction, there are diffuse miliary and reticular densities throughout major portions of both lungs, which had not been present on earlier films.

In mid-October, 1959, various preventive measures were introduced, including the use of wet instead of dry bagasse, application of a special wetting agent, enclosure of the bale-breaking machine, and installation of various exhaust devices. Thereafter there was a sharp reduction in the number of cases of bagassosis, with only two workmen becoming ill during the months of November and December. Both of these patients had previously been exposed to dry bagasse.

Physical Findings.—Examination of the patient on Nov. 3, 1959, disclosed a tall, thin, white man who did not appear to be ill or in any particular distress but who became obviously short of breath on mild exertion and who coughed frequently. The temperature was 98.6 F (37.0 C), pulse, 112 beats per minute, and blood pressure, 120/74 mm. Hg. Fine, crepitant rales were heard over the right lower lung field posteriorly. The heart was normal, and there was no physical evidence of pulmonary hypertension. A firm, freely movable lymph node, measuring 1½ x 1 cm., was palpable in the right supraclavicular fossa. The remainder of the physical examination was essentially negative.

Laboratory Data.—Roentgenographic examination of the chest on Nov. 4, 1959, disclosed many small miliary and reticular densities throughout the entire extent of both lungs, suggesting an interstitial type of involvement. Other densities were more linear and confluent in the peripheral portions of the right upper lung field and, to a lesser extent, in the periphery of the left upper lobe. Large cystic structures were present in both pulmonary apices. The electrocardiogram was interpreted as being consistent with right ventricular hypertrophy.

A blood count revealed white blood cells, 8,400 per cubic millimeter, neutrophils, 65%, lymphocytes, 26%, monocytes, 7%, and eosinophils, 2%, red blood cells, 5,350,000 per cubic millimeter, hemoglobin level, 15.5 Gm.%, hematocrit determination, 47%, and sedimentation rate, 37 mm. in one hour (Wintrobe).

Analysis of the urine disclosed no abnormality. Blood chemistry values were as follows: serum bicarbonate level, 24 mEq., serum chloride, 97 mEq., serum calcium, 10 mEq., and serum phosphorus, 3.92 mEq. per liter. A stool examination was negative for occult blood, parasites, and ova.

Skin tests performed with tuberculin (first and second strength) purified protein derivative, blastomycin, coccidioidin, histoplasmin, and toxoplasmin were all negative.

A gram stain of the sputum showed moderate numbers of white blood cells, gram-negative and gram-positive cocci, and gram-negative bacilli. Sputum cultures produced a predominant growth of Neisseria catarrhalis, a few colonies of Staphylococcus aureus and alpha streptococcus, and rare Aerobacter aerogenes. The initial smear of concentrated sputum, prepared with an acid-fast stain, disclosed atypical acid-fast bacilli, numbering 1 to 5 per high-power field. These organisms were extremely pleomorphic, varying from long filamentous forms to shorter and thicker ones, beaded structures resembling typical tubercle bacilli, while still others were very small and short, almost coccus-like in appearance. Four subsequent examinations of the concentrated sputum failed to detect these organisms, and eight sputum cultures for tubercle bacilli showed negative findings. The sputum was also cultured five times for fungi, but no growth was obtained.

Biopsy of a cervical lymph node disclosed no definite pathological changes. Studies of pulmonary function showed that the patient was capable of a surprisingly good ventilatory performance, exhibiting a vital capacity of 5,218 cc (calculated normal, 4,385 cc) and a maximum breathing capacity of 240 liters per minute, (normal 154 liters per minute) However, the arterial oxygen saturation was lowered to 90% at rest and fell to 82% after exercise, while the carbon monoxide diffusion was 9 0 ml/min/mmHg, compared to an average normal of 20

Clinical Course —When first seen on Nov 3, 1959, the patient had already begun to experience spontaneous remission of symptoms No treatment of any type was utilized, other than rest and good nutrition Steady clinical improvement continued and during a period of one week, chest pain, cough, and sputum production disappeared The patient's exercise tolerance improved until he experienced dyspnea only on prolonged exertion, his strength and appetite increased, and he gained six pounds in weight However, a repeat roentgenographic examination of the chest on Nov 10, 1959, showed no significant clearing of the pulmonary densities Nonetheless, the patient continued to improve, and by Nov 30, 1959, he was completely asymptomatic and had regained 20 pounds of weight Roentgenographic examination of the chest on this date disclosed marked regression of the small reticular and miliary densities in both lungs, the general appearance of this film closely approximated that of roentgenograms taken prior to the onset of the series of respiratory illness When last seen on Dec 23, 1959, the patient had returned to work and was feeling well He had avoided further contact with bagasse dust

Comment

Bagassosis has, for a number of years, been relegated to the rather unimportant position of a mere medical curiosity This impression has been attributed primarily to the relatively few cases which have been reported in the world's literature (62 in all, 27 from the United States, 17 from England, 13 from India, and 5 from Italy), to the apparent decrease in the incidence of the disorder in recent years (5 cases reported in the United States since 1952), and to the very limited number of areas in which the disease has been recognized

It has now become increasingly clear that this attitude is no longer tenable As has been pointed out in previous reports,[2] many cases from Louisiana have never been reported, a considerable number are known to have occurred in recent years, and some 80 cases have been observed in Puerto Rico since May, 1959 [1c] Thus, bagassosis cannot continue to be regarded as a rare medical curiosity but must be considered in its rightful place as an industrial disease of growing importance

Much remains to be learned concerning this illness, but at least the mystery surrounding its geographical distribution seems to be gradually dissolving with the appearance of the disease in Puerto Rico and the addition of Peru to the list of sugar cane–producing countries from which bagassosis has been reported

Summary and Conclusions

The first patient to contract bagassosis in Peru was also the first of 80 workmen to develop the disease during a recent outbreak of bagassosis in Puerto Rico Bagassosis can no longer be looked upon as a rare medical curiosity but must now be regarded as an *occupational disease* of considerable importance, representing a potential hazard wherever sugar cane is grown and bagasse is utilized for manufacturing purposes The absence of reported cases in many sugar cane–producing countries of the world is difficult to understand, and it is postulated that the disease is occurring in at least some of these areas but has not been recognized or publicized

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New Psychotherapeutic Agent, Chlordiazepoxide

Use in Treatment of Anxiety States and Related Symptoms

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In a collaborative study by several psychiatrists, 135 women and 77 men with symptoms of directly perceived anxiety, phobic reactions, obsessive thinking and compulsive behavior, depression, tension, psychomotor and motor retardation, hysterical acting-out behavior, and conversion reactions were treated with chlordiazepoxide. A favorable response was reported in 80.2%. Initial doses were 25 mg. once or twice a day, increased, in some patients, by increments of 25 mg. to a total maximal daily dose of 175 mg. Maintenance doses ranged from 10 to 150 mg. daily and duration of treatment was from one week to 13 months. The most prominent side-effects, drowsiness and ataxia, were dose-related. The drug was discontinued because of reactions in six (2.8%) instances. Disturbances related to the extrapyramidal system did not occur. Hemograms, urinalyses, and liver function tests remained within normal range.

IN A CANVASS of the population of a central residential area in New York City, Rennie and coworkers[1] found anxiety to be present in 75% of the study group. It is not surprising, therefore, that this era has been called the age of anxiety. Several of the tranquilizing agents now in clinical use obtund this frequently occurring symptom of neurotic and psychotic illness by inducing sedation accompanied by obscured awareness and impaired mental acuity.

In this connection, the observation by Randall[2] was of particular interest, that chlordiazepoxide hydrochloride, which belongs to a new class of therapeutic agents, produces marked tranquilization and taming of experimental animals without sedation or lessening of motor activity. He reported this damping effect to be more pronounced than that of either meprobamate or the phenothiazines. A drug with pharmacological properties so different in some parameters from those of other tranquilizers appeared worthy of clinical investigation. Therefore, we embarked on a study of chlordiazepoxide, which chemically is 7-chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine 4-oxide.

During the initial phase of its evaluation in December, 1958, chlordiazepoxide was administered to a group of excited schizophrenics. In four of these patients the severe anxiety, which was a prominent feature of their symptomatology, was dramatically improved. Therefore, a study of the effects of the drug on anxiety-tension states was initiated on Jan. 2, 1959. This paper describes the findings in a cooperative effort of several psychiatrists collaborating with the Bureau of Research during the ensuing 15 months of observation. It includes 212 patients and supersedes our preliminary report on 79 patients, which was presented at the University of Texas Medical Branch Symposium on Newer Antidepressant and Other Psychotherapeutic Drugs, in November, 1959.[3]

Method and Materials

The collaborating psychiatrists followed a research design formulated by us; we also coordinated the investigation. The patients, who were chosen from private practice, were admitted to the study if they clearly presented a directly perceived or covert chronic anxiety reaction, with or without the presence of other psychological defense mechanisms. Close to 300 patients were treated with chlordiazepoxide, but, as mentioned, only 212 are included in this report. The remaining patients were not followed up over a sufficiently long period or were lost from observation.

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The symptom profiles of the patients in the entire series included directly perceived anxiety, phobic reactions, obsessive thinking and compulsive behavior, depression, tension, psychomotor and motor retardation (lethargy, fatigue, and loss of interest in usual activities), hysterical acting-out behavior, conversion reactions, and physical concomitants (involving primarily the cardiovascular, respiratory, and gastrointestinal systems and changes in the sleep pattern) Not all patients showed all these symptoms

The entire material, which was divided into seven study groups and five major primary diagnostic categories (see below), consists of pooled data contributed by one of us (J M T) (Group I) and the following collaborating investigators without whose cooperation this report would not have been possible Drs Ivan F Bird, Trenton, N J (Group II), Daniel E Boyle, Trenton, N J (Group III), David W McCreight, New Jersey State Hospital, Marlboro (Group IV), Robert S Garber, Trenton, N J (Group V), Moke W Williams, Fort Lauderdale, Fla (Group VI), and Russel N Carrier, John E Caton, Emil P Weber, Frank P Spitzer, and Jack L Ward, Carrier Clinic, Belle Mead, N J (Group VII)

There were 135 female and 77 male patients in the entire series The ages of the patients ranged from 12 to 76 years Duration of their illness and median duration of illness within the seven study groups ranged from two months to 27 years and from 1 5 to 6 years, respectively The anxiety and related symptoms were severe in 160 cases, moderate in 30, and mild in 22 In 179 instances the anxiety was directly perceived The five diagnostic categories were represented by 147 psychoneurotic reactions, 31 affective reactions, 22 psychoneurotic schizophrenic reactions, 8 schizophrenic reactions, and 4 schizo-affective reactions

The majority of patients had failed to respond to other psychopharmacological agents and, thus, served to some degree as their own controls Except for the occasional administration of a night-time sedative, most patients did not receive any medication for two to three weeks before institution of treatment with chlordiazepoxide

Base-line studies carried out prior to the patients' admission to the present program included a psychiatric evaluation, a complete physical examination, and laboratory studies (hemogram, urinalysis, and van den Bergh's and cephalin flocculation tests) A standard symptom profile listing the common symptoms and major defense mechanisms associated with anxiety reactions was included in the protocol as a coded check sheet

In the beginning of the study patients received 50 mg of chlordiazepoxide three times daily However, as more experience with the drug was gained, this was modified to an initial dose of 25 mg once or twice a day for 14 days Thereafter, in most instances, the daily dose was increased by increments of 25 mg at weekly intervals to a maximal daily dose of up to 175 mg In general a maintenance dose, which ranged from 10 to 150 mg per day, was established when significant improvement was achieved When side-effects occurred, dosage was reduced by a descending schedule or the drug was discontinued In 211 patients the treatment period with chlordiazepoxide ranged from one week to 13 months, and in one patient drug administration was discontinued after one day because of an acute dissociative reaction

Psychiatric evaluations and physical examinations were repeated at suitable intervals throughout the treatment period The laboratory studies, which were done at frequent intervals during the initial phase of this program and at approximately four-week intervals thereafter, were discontinued during the last four months because all values of the tests made had remained within normal limits

Psychotherapeutic interviews were continued for all patients during the treatment period Their frequency varied within the study groups from three hours per week to once a month

The over-all response to chlordiazepoxide was evaluated by the individual psychiatrists according to the following rating *Excellent* (complete or marked relief of symptoms and significant improvement in patient's over-all adjustment, if this had been seriously affected by the disorder), *Good* (significant relief of symptoms in either degree or frequency or both), *Fair* (appreciable relief of symptoms in either degree or frequency or both), *Negative* (symptoms not changed or slightly improved), and *Condition worse* (symptoms aggravated)

Furthermore, the subjective improvement of the individual symptoms was classified according to the patients' own appraisals, with use of the following rating *Complete relief* (no discomfort and no perceived anxiety), *Marked relief* (minimal discomfort and minimal perceived anxiety, usually limited to specific situations), *Significant relief* (slight discomfort and slight perceived anxiety), *Appreciable relief* (improvement clearly recognizable as difference of degree of discomfort and perceived anxiety), *Slight relief* (improvement barely recognizable as difference of degree of discomfort and perceived anxiety), *No relief*, and *Aggravation of condition*

Since the inception of this program, chlordiazepoxide was discontinued in 61 of the 212 patients included in this report because the desired effects were maintained without continuation of drug therapy, for administrative reasons, or because of side reactions Except for a very few patients who could not be reached, those who are presently not taking chlordiazepoxide were reevaluated prior to the final assessment of the over-all results

Results

Over-all Response.—Table 1 summarizes the over-all response of the 212 patients treated with chlordiazepoxide, according to the psychiatrists' evaluation. The results are shown by study groups and by diagnostic classifications.

As is seen, the response was excellent in 47 cases, good in 78, and fair in 45. Thus, in 170 patients or 80.2% some degree of favorable response was achieved, 39 patients failed to show any improvement, in three instances the condition became aggravated.

In the diagnostic category of psychoneurotic reactions, the response was excellent in 32 patients, good in 62, and fair in 32, for an incidence of success of 85.7%. The corresponding figures for the other two categories represented by significant numbers of patients were as follows: Eleven excellent, five good, and eight fair responses, for an incidence of success of 77.4% in the affective reactions, and four excellent, seven good, and five fair responses, for an incidence of success of 72.7% in the pseudoneurotic schizophrenic reactions.

TABLE 1.—Over-all Response of 212 Patients Treated with Chlordiazepoxide According to Psychiatrists' Evaluation*

	Psychoneurotic Reactions						Affective Reactions						Pseudoneurotic Schizophrenic Reactions						Schizophrenic Reactions						Schizo-affective Reactions					
Study Group	E	G	F	N	W	T	E	G	F	N	W	T	E	G	F	N	W	T	E	G	F	N	W	T	E	G	F	N	W	T
I	3	12	3			18		3	4			7		3	1		2	6												
II	2	7	11	9		29	1		2	1		4		2		1		3				1		1						
III	4	20	9	5		38				1		1								1		2		3		1				1
IV	2	2				4	4					4																		
V	10	9	2			21	5	1		2		8	4			1		5												
VI	2	5	6	2		15								2	4	2		8		1		2		3				3		3
VII	9	7	1	4	1	22	1	1	2	3		7								1				1						
Total	32	62	32	20	1	147	11	5	8	7		31	4	7	5	4	2	22		3		5		8		1		3		4

* E, excellent response; G, good response; F, fair response; N, negative response; W, condition worse; T, total.

TABLE 2.—Subjective Improvement of Directly Perceived Anxiety Experienced by 177 Patients Treated with Chlordiazepoxide

	Diagnostic Categories					
Subjective Response	Psychoneurotic Reactions	Affective Reactions	Pseudoneurotic Schizophrenic Reactions	Schizophrenic Reactions	Schizo-affective Reactions	Total
Complete relief	12	9	2			23
Marked relief	48	4	8			60
Significant relief	28	4	2	1	1	36
Appreciable relief	18	1	1	1		21
Slight relief	10	2	2	1		15
No relief	9	1	3	3	3	19
Aggravation of condition	2		1			3
						177

Subjective Response.—Table 2 summarizes the subjective improvement of directly perceived anxiety experienced by 177 patients. (The additional two subjects who exhibited free-floating anxiety were excluded from the evaluation because one of them was treated with chlordiazepoxide for only one day and the other refused to adhere to a maintenance dose and took the medication only prior to an anticipated stressful situation.) As can be seen, relief was complete in 23 cases, marked in 60, significant in 36, appreciable in 21, and slight in 15 patients. Thus, in 155 patients or 87.6% some degree of favorable subjective response was achieved in this parameter. Nineteen patients failed to experience any relief and in three instances the anxiety became worse. In the diagnostic category of psychoneurotic reactions the relief was complete in 12 patients, marked in 48, significant in 28, appreciable in 18, and slight in 10, for an over-all incidence of success of 91.3%. The corresponding figures for the other two categories represented by significant numbers of patients were as follows: nine complete, four marked, four significant, one appreciable, and two slight relief, for an incidence of success of 95.2% in the affective reactions, two complete, eight marked, two significant, one appreciable, and two slight relief, for an incidence of success of 78.9% in the pseudoneurotic schizophrenic reactions. If only the responses classified as appreciable to complete relief are considered as unquestionable improvement, the percentages of success in these three diagnostic categories were 83.4, 85.7, and 68.4, respectively.

Table 3 summarizes the subjective improvement in individual symptoms other than directly perceived anxiety. As is seen, the eight different symptoms encountered in the entire series of 212 patients occurred for a total of 477 times. Some degree of favorable response was achieved in 410 instances or 85.9%.

Of the 105 patients who experienced clearly defined phobic reactions, 98 or 93.3% derived some degree of subjective relief. The 78 patients whose relief ranged from appreciable to marked continued to experience phobic anxiety occasionally in certain situations, particularly when they were directly confronted by their phobic object, but the frequency and degree of reactions were reduced.

Of the 43 patients who exhibited obsessive thinking and compulsive behavior, 35 or 81.4% derived some degree of subjective improvement. Depression was present as a discrete symptom in 71 patients, of whom 59 or 83% experienced some degree of subjective relief Tension, which was a component of the symptomatology in 120 patients, was subjectively relieved to some degree in 97 or 80 8% Lethargy, fatigue, and loss of interest in their usual activities were experienced by 58 patients, of whom 55 or 94 8% derived some degree of subjective improvement Physical concomitants of the types mentioned earlier in this report were present in 41 cases Of these, 34 patients or 83% derived some degree of benefit Classic conversion reactions were exhibited by 16 patients, of whom 14 or 87 5% experienced complete to slight relief of this symptom Finally, there were 23 patients who had a recent history of episodic hysterical acting-out behavior In 18 of these patients or 78 2%, the intensity of this behavior pattern was reduced during treatment with chlordiazepoxide

TABLE 3 —Subjective Improvement of Symptoms Other Than Directly Perceived Anxiety Experienced by 212 Patients Treated with Chlordiazepoxide

Symptom	Subjective Response Complete Relief	Marked Relief	Significant Relief	Appreciable Relief	Slight Relief	No Relief	Condition Worse	Total
Phobic reactions	10	31	28	19	10	6	1	105
Obsessive thinking and compulsive behavior		6	10	10	9	7	1	43
Depression	8	14	18	9	10	11	1	71
Tension	13	35	20	15	14	21	2	120
Lethargy etc	15	17	15	3	5	3		58
Physical concomitants	3	13	10	7	1	7		41
Conversion reactions	2	7	4		1	1	1	16
Hysterical acting out behavior		5	7	5	1	4	1	23

Changes in Sleep Pattern —Of the 212 patients in the entire series, 60 complained of insomnia which was combated with ethchlorvynol or methyprylon When treatment with chlordiazepoxide was initiated these hypnotics were discontinued Of these 60 patients 45 or 75% reported improvement of their sleep pattern during the treatment period without addition of a night-time sedative Thirty-seven other patients reported that their sleep was improved In contrast, five subjects stated they developed difficulty in falling asleep or became restless during the night There was one patient who complained of a tendency toward somnolence which was markedly improved during the period of treatment with chlordiazepoxide The remaining 109 patients did not report any change in their sleep pattern

Appetite and Weight —Eighty-one patients reported improvement of appetite while they received chlordiazepoxide This was most clearly apparent in those subjects who had initially complained of loss of appetite Weight gain, associated with increase of appetite, ranging from 1 to 30 lb (0 5 to 13 6 kg) (average 6 lb [2 7 kg]) was observed in 74 patients Weight gain was excessive (>12 lb [5 0 kg]) in seven of these patients A weight loss was observed in four patients and this ranged from 2 to 7 lb (0 9 to 3 2 kg)

Physical and Laboratory Findings —Changes in pulse rate, respiration, and temperature were not observed during the entire period of study Similarly, blood pressure changes did not occur in any of the 208 normotensive patients In two of the four patients who had hypertension initially, this was not changed essentially during the treatment period The blood pressure reading of one other patient with hypertension was 168/80 mm Hg when he was taking rauwolfia prior to admission to this study Rauwolfia was discontinued, and after 20 weeks of therapy with chlordiazepoxide his blood pressure was 140/80 mm Hg The blood pressure of the fourth patient with hypertension that was severe rose to 220/120 mm Hg during her treatment period This episode was apparently precipitated by an acute situational conflict, but it was not accompanied by increased anxiety, headaches, or dizziness Rauwolfia and a diuretic were administered conjointly with chlordiazepoxide and she became normotensive

TABLE 4 —Side Effects Occurring in 55 Patients of a Series of 212 Cases Treated with Chlordiazepoxide

Side Effect	Group* I	II	III	IV	V	VI	VII	Total Side Effects No
Drowsiness	8	4		1	26	2	3	44
Ataxia	1	1	1	1	9			13
Constipation	1				7			8
Excessive weight gain	3		1		3			7
Dissociative reactions	3		1			1		5
Muscle tenderness and spasm	2	1			1			4
Headache		1			2		1	4
Acute rage reactions	3							3
Urinary frequency	1	2						3
Increased irritability	1				1	1		3
Motor or psychomotor hyperactivity		2						2
Loss of libido	2							2
Changes in menstruation		1			1			2
Dizziness		1					1	2
Rash		1			1			2
								104

* Figures under groups are numbers of patients who experienced side effects

As for laboratory findings, hemograms, urinalyses, and liver function tests all remained within normal limits

Side Effects —Table 4 summarizes the side effects which were observed in 55 patients The reactions are listed in accordance with the frequency of their occurrence Unless specifically stated in the following discussion, the side effects were not sufficiently severe to discontinue treatment with chlordiazepoxide

Drowsiness was present in 44 cases or 20 7% This reaction, which was severe in three instances, required discontinuation of medication in one patient She was a 44-year-old woman who complained of extreme drowsiness which interfered with her activities One of the other patients with a severe reaction experienced a marked hypnotic effect together with a bizarre dissociative reaction (see below) In 41 cases the drowsiness was mild, did not inconvenience the patients, and disappeared, in some after reduction of dosage and in others without such measures

Ataxia occurred in 13 patients or 6 1% In three cases it was sufficiently severe to require discontinuation of treatment One of these patients was a 55-year-old man who had been taking large amounts of meprobamate for several years This drug was abruptly discontinued and the patient received a daily dose of 75 mg of chlordiazepoxide for one week All his previous symptoms became aggravated and he developed ataxia with retropulsive gait and pinpoint pupils Meprobamate was reinstituted and the ataxia cleared The second patient, a 57-year-old woman, had previously received 25 mg of chlordiazepoxide per day for six weeks without any evidence of intolerance After a medication-free period of one month she was given imipramine for eight days without improvement, whereupon chlordiazepoxide was reinstituted After the first 25-mg dose, she noted a slight ataxia which became marked by the third day and did not improve, although the dosage was reduced to 10 mg per day Medication was discontinued on the seventh day The third patient was a 20-year-old woman who developed ataxia during the fourth week of treatment with 25 mg twice daily In the remaining 10 patients, this symptom was mild and disappeared in most instances without reduction of dosage

Constipation, which occurred in eight patients or 3 8%, was easily controlled by laxatives As mentioned before, excessive weight gain was recorded in seven cases or 3 3% One of these patients, a 47-year-old man, who had taken 75 mg of chlordiazepoxide per day for 20 weeks and had gained 27 lb (12 3 kg), discontinued medication on his own initiative because he felt that he no longer needed the drug The weight gain, which was desirable in some patients and annoying to others, could be controlled in several instances by dietary measures

Dissociative reactions were observed in five patients or 2 4% early in the course of treatment, when they received a daily dose of 50 to 75 mg of chlordiazepoxide In four instances the reactions occurred in patients in the category of pseudoneurotic schizophrenia and the fifth case was in a severe psychoneurotic These reactions were characterized by confusion and a marked feeling of depersonalization—manifestations which in one instance were accompanied by changes in spatial and temporal perception Two of the patients in the category of pseudoneurotic schizophrenia experienced acute rage reactions simultaneously Both had had similar episodes in the past In one of them treatment was reinstituted on a gradually ascending dosage schedule, without recurrence of these side effects, and the other patient was lost from observation In another patient in the category of pseudoneurotic schizophrenia (the one referred to above as having experienced also a marked hypnotic effect) and in the patient with a psychoneurotic reaction, chlordiazepoxide was reinitiated at a low dose which was gradually increased without recurrence of the dissociative reactions These observations suggest that in patients with a history of this type of reaction, small doses of chlordiazepoxide should be given initially, followed by a gradual increase Treatment of the fourth patient with pseudoneurotic schizophrenia was discontinued for administrative reasons

Four patients or 1 9% complained of muscle tenderness and spasm In one of these, who also experienced headaches and urinary frequency, these side effects reappeared after reexposure to chlordiazepoxide Therefore, the drug was discontinued in this instance

Headaches occurred in four patients or 1 9%, one of whom experienced also muscle spasm and urinary frequency (see above) One of the other patients had a history of migraine Since, on reexposure to chlordiazepoxide, this patient also experienced severe headaches again, drug therapy was stopped

Acute rage reactions occurred in three patients or 1 4% who had had similar episodes in the past They were all in the category of pseudoneurotic schizophrenic reactions In two of these, dissociative reactions were observed at the same time (see above) The third patient had ingested 200 5-mg aspirin tablets in a hysterical episode In two of these patients chlordiazepoxide was reinstituted without any further difficulties and the patient in one of the cases, in which the rage reaction was associated with a dissociative reaction (see above), was lost from observation

Urinary frequency was experienced by three patients In one of these, who complained also of muscle tenderness and headaches, chlordiazepoxide was discontinued (see above) Three patients developed increased irritability and two, motor and psychomotor hyperactivity These reactions disappeared after reduction of dosage Loss of libido, which occurred in two patients, one man and one woman, was not a serious problem Menorrhagia was reported by two patients Chlordiazepoxide was discontinued because both women failed to derive significant improvement from the drug Mild dizziness occurred in two patients and subsided without reduction of dosage Two patients developed a mild generalized skin eruption Medication was discontinued because they failed to show any improvement

To date chlordiazepoxide has been discontinued in 61 patients, but in only six of these because of reactions Another side effect (not listed in table 4) observed in 23 patients was increased productivity of speech and ease of association during therapeutic interviews

Comment

A clinically demonstrable improvement in 170 (80 2%) of a series of 212 patients who suffered from directly perceived anxiety and related symptoms and were treated with chlordiazepoxide indicates that this drug is an active psychopharmacological agent The antianxiety effect of the compound is best illustrated by the fact that of 177 patients who experienced free-floating anxiety, 155 or 87 6% derived some degree of relief

The incidence of improvement of related symptoms such as phobic reactions, obsessive thinking and compulsive behavior, depression, tension, lethargy, physical concomitants, conversion reactions, and hysterical acting-out behavior was closely parallel to the incidence of relief of the directly perceived anxiety The rate of improvement of these symptoms ranged from 78 2 to 94 8% The most striking responses occurred in the patients with phobic reactions which were reduced considerably in degree and frequency Patients who experienced relief of this symptom often reported that the fearful idea would occur occasionally, especially when they were confronted with the phobic object or situation, but that the accompanying affective and physical concomitants were considerably less severe Patients who reported relief of their obsessive thinking sometimes continued to experience the ideational phenomena without the affective component The improvement of depression was most consistent when this symptom occurred in conjunction with directly perceived anxiety However, in some cases there was a dichotomy of response in that the anxiety was relieved, but the depression remained essentially unchanged The improvement of depression was less pronounced in the presence of severe retardation

Tension was usually relieved conjointly with other symptoms Yet, in some of the 21 patients who failed to experience relief of tension, other symptoms improved markedly Lethargy, fatigue, and loss of interest in usual activities, as well as the symptom complex of physical concomitants, often subsided when the anxiety was relieved However, an occasional patient, whose perceived anxiety was greatly reduced, continued to experience some tachycardia and sweating during stressful situations Generally, conversion reactions, which occurred with the least frequency in our series, responded well to chlordiazepoxide It is difficult to assess the effectiveness of any drug against hysterical acting-out behavior Notwithstanding, there can be but little doubt that the frequency and severity of these episodes were reduced in most patients

In many cases, the response to chlordiazepoxide was dramatic and occurred within a few days after institution of treatment In fact, not infrequently, gratifying results were obtained within a matter of hours after the initial dose Some patients have been able to avoid episodes of acute panic by taking 25 to 50 mg of chlordiazepoxide one-half hour prior to the anticipated stressful situation, such as a public meeting, a social event, or a railroad trip

Twenty-three patients reported that the drug effect diminished somewhat after prolonged treatment In most of these instances, this development of tolerance was observed after several months of drug administration, but in a few it occurred after three to four weeks of treatment In some of these cases, an increase of dosage resulted in reattainment of the initial high degree of efficacy and in others it did not On the other hand, there were patients who had been receiving chlordiazepoxide for six months and longer who had not experienced any decrease in its effectiveness Not infrequently, patients reported a sense of well-being which was considered by some of our collaborators as a mild euphoria-like phenomenon This may represent a direct pharmacological effect of chlordiazepoxide, but it may also be interpreted as the patient's response to the reduction of anxiety and related symptoms Physical dependence, indicative of addiction, was not observed in any of the patients, although in some the medication was withdrawn abruptly after several months of continuous treatment Habituation is an ever-present possibility, but problems of this type have not been observed to date

According to the psychiatrists' evaluation, there were 42 treatment failures (19 8%) Considering the symptom of directly perceived anxiety alone, there were 19 patients (10 7%) who did not derive any benefit and 3 (1 7%) whose anxiety became worse The latter had been abruptly withdrawn from other psychosedatives Considering the other symptoms collectively, a total of 60 symptoms (12 6%) did not improve and 7 (1 5%) became aggravated Of the latter symptoms, three occurred in patients who had been abruptly withdrawn from other psychosedatives

Although the incidence of side effects was relatively high, they were mostly transient and relatively inconsequential Drowsiness and ataxia were the most frequently occurring reactions and these were almost invariably related to overdosage The administration of chlordiazepoxide was discontinued because of side effects in only six patients (2.8%). It is worthy of note that reactions referable to the extrapyramidal system did not occur. Furthermore, even prolonged administration of chlordiazepoxide did not produce any untoward effects on the hematopoietic system or on renal and hepatic function. All these findings indicate that the drug has a wide margin of safety.

It appears from this study that chlordiazepoxide is most effective in cases in the diagnostic categories of psychoneurotic, affective, and pseudoneurotic schizophrenic reactions, characterized by a symptom profile including directly perceived anxiety, phobias, obsessive thinking and compulsive behavior, anxious depressions, tension, lethargy, fatigue, and related symptomatology. Furthermore, we believe that chlordiazepoxide is definitely useful in conjunction with psychotherapy.

Since presenting the preliminary evaluation of chlordiazepoxide, we have almost tripled the number of cases studied and could thus offer this more definitive appraisal of the merits of this psychotherapeutic agent.

From the results observed it appears that chlordiazepoxide has three psychopharmacological actions, viz., an antianxiety effect, a sedative effect, and a stimulating effect. The antianxiety effect is not predicated on the sedative action since there were many patients whose anxiety and concomitant symptoms lifted without the occurrence of drowsiness, improvement of sleep pattern, or any other effects suggestive of sedation. On the other hand, there were patients whose anxiety was controlled and who were sedated at the same time. It is likely, therefore, that the threshold of the antianxiety action of chlordiazepoxide is lower than that of its sedative effect. Be that as it may, the antianxiety effect of chlordiazepoxide is certainly more specific than that of meprobamate, the rauwolfia alkaloids, and the phenothiazines, since with these drugs, in contrast to chlordiazepoxide, anxiety and tension states are relieved only when depression of the central nervous system is induced. It appears that this is one of the parameters in which chlordiazepoxide differs from other psychotherapeutic sedatives. The greater specificity of chlordiazepoxide against anxiety states is also obvious if one considers that the majority of our patients had failed to respond to other tranquilizing agents, but were relieved of their anxiety reactions and other psychological defense mechanisms when treated with chlordiazepoxide. Finally, the drug's psychostimulating effect is apparent in the feeling of well-being, the increase of interest in social activities, drive, verbal productivity, and appetite and in the lifting of anxious depressions in many patients.

In a recent preliminary communication, Harris[4] briefly summarized his findings with chlordiazepoxide, which are in complete agreement with those reported by Tobin and others.[3] Harris reviewed the work by Bowes,[5] Breitner,[5] Constant,[5] Kinross-Wright and co-workers,[5] and Sussex,[5] all of whom reported observations which confirm our original findings[3] with chlordiazepoxide. The studies by Robinson[5] in dermatology and by Thomas[5] in internal medicine, both cited by Harris,[4] suggest that chlordiazepoxide is a very valuable agent in the treatment of conditions which are associated with and probably predicated in part on abnormal emotional reactions, particularly anxiety and tension states.

The results of all the aforementioned authors are in agreement with our findings that chlordiazepoxide abolishes or decreases anxiety and related symptoms, mostly without depression of the central nervous system if dosage is adjusted to the patient's need. Moreover, the consensus of all workers is that this drug has a margin of safety greater than that of other psychopharmacological agents with tranquilizing properties. Clarke and co-workers[6] reported two cases of attempted suicide with chlordiazepoxide. One of the patients ingested 875 mg. in one dose and the other 1,630 mg. within a 24-hour period. Gastric lavage was not carried out in either of the patients, yet they made uneventful recoveries. In fact, drowsiness, ataxia, and dysarthria were the only ill effects noted. These two case reports clearly demonstrate the high degree of safety of chlordiazepoxide.

Summary and Conclusions

Chlordiazepoxide was administered to 212 patients whose predominant symptomatology was anxiety, with or without the presence of other specific psychological defense mechanisms. The series included 135 women and 77 men. Their ages ranged from 12 to 76 years and the duration of their illness from two months to 27 years. The following major diagnostic categories were represented: psychoneurotic reactions (147 patients), affective reactions (31 patients), pseudoneurotic schizophrenic reactions (22 patients), schizophrenic reactions (8 patients), and schizo-affective reactions (4 patients).

Anxiety and related symptoms were severe in 160 cases, moderate in 30, and mild in 22. In 179 patients the anxiety was directly perceived. The symptomatology included the following other components: phobic reactions, obsessive thinking and compulsive behavior, depression, tension, lethargy, fatigue and similar manifestations, physical concomitants, conversion reactions, and hysterical acting-out behavior.

Psychiatric evaluations, complete physical examinations, and laboratory studies were carried out for all patients initially and at suitable intervals thereafter.

After some experience with the drug, the initial daily dose of chlordiazepoxide was 25 mg. once or twice a day, and this was increased by increments of 25 mg to a maximal daily dose of 175 mg in some patients The maintenance dose ranged from 10 to 150 mg per day The duration of treatment ranged from one week to 13 months, with the exception of one patient in whom drug administration was discontinued after one day

Results were evaluated in two ways, viz, by the individual investigators with respect to the patients' over-all response and by the patients with respect to the subjective improvement of the individual symptoms For both methods rating systems were used According to the psychiatrists evaluation, the response was excellent in 47 cases, good in 78, and fair in 45, an incidence of success of 80 2%

Of the 177 patients who assessed the improvement of their directly perceived anxiety, relief was complete in 23 cases, marked in 60, significant in 36, appreciable in 21, and slight in 15 cases Thus, in 155 patients or 87 6% some degree of favorable subjective response was achieved in this parameter The percentages of subjective improvement of the other symptoms were of the same order

Side effects, of which drowsiness and ataxia were the most prominent, were rarely of a serious nature and were almost invariably related to overdosage Reactions referable to the extrapyramidal system did not occur Chlordiazepoxide was discontinued in six patients, or 2 8%, because of side effects Hemograms, urinalyses, and liver function tests all remained within the normal clinical range

Chlordiazepoxide has three different pharmacological actions, viz, an antianxiety, a sedative, and a stimulating effect The antianxiety action is not predicated on the sedative effect and is more specific than that of the tranquilizers so widely used, because with the latter drugs, in contrast to chlordiazepoxide, anxiety states are only relieved when depression of the central nervous system occurs, which manifests itself by obscured awareness and impaired mental acuity The psychostimulating effect of chlordiazepoxide is apparent, among other parameters, in the lifting of anxious depressions

It is concluded that chlordiazepoxide (Librium) is a most valuable agent which is more specific against anxiety and tension states than the tranquilizing agents Chlordiazepoxide constitutes a most interesting development which makes possible successful treatment of patients with the aforementioned conditions, who heretofore have been refractory to all other modalities of therapy

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The chlordiazepoxide hydrochloride used in this study was provided as Ro 5 0690 and later as Librium hydrochloride by Hoffmann-La Roche Inc, Nutley, N J The generic designation of Librium has been changed from methaminodiazepoxide to chlordiazepoxide

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CHARCOT ON HYSTERIA—Charcot had recognized the role played by emotion, imagination suggestion, fabrications, and prevarication in all hysteric phenomena From a therapeutic point of view, he advised against methods of cultivating the disease, but, on the contrary, recommended isolation of the patients from each other and from their families, as well as the use of persuasion reinforced by physical therapy and electrotherapy Because of the ignorance that shrouds the ideas of Charcot on the phenomena of the hysteric neuroses and on his methods of treatment and in the interest of historic accuracy, I feel it necessary to refer to some of his own writings Charcot, for example, was very much aware of the malingering found among some hysterics In one of his lectures he said 'This brings me to say a few words about malingering It is found in every phase of hysteria and one is surprised at times to admire the ruse, the sagacity, and the unyielding tenacity that especially the women, who are under the influence of a severe neurosis, display in order to deceive especially when the victim of the deceit happens to be a physician —G Guillain J-M Charcot, 1825-1893 His Life—His Work, edited and translated by P Bailey, New York, Paul B Hoeber, Inc, 1959

Strongyloides Stercoralis Infestation

Malabsorption Defect with Reaction to Dithiazanine Iodide

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It is not generally recognized that patients infested with *Strongyloides stercoralis* may have intestinal malabsorption, although this has been demonstrated by roentgenologic techniques A heavily infested patient manifesting this symptom suffered a lethal reaction to a small dose of dithiazanine iodide Usually this cyanine dye is sparingly absorbed, and serious toxicity has not been reported during its clinical trials At necropsy, however, this patient showed evidence of dye absorption in the intestinal lymphatic channels and staining of the viscera This unexpected reaction may be explained on the basis of phagocytosis of dye particles by the inflamed intestinal mucosa, the process being enhanced by slow transit of the dye through the upper intestine It is recommended, therefore, that malabsorption be ruled out before giving this drug to patients with heavy infestations of this type

PATIENTS heavily infested with *Strongyloides stercoralis* may present a variety of symptoms Diarrhea, constipation, alternating diarrhea and constipation, abdominal tenderness, vague abdominal distress, heartburn, gaseous discomfort, nausea and vomiting, colitis, and jaundice have all been observed We have recently seen a patient with this disease who suffered from a malabsorption defect, manifested by steatorrhea and hypoproteinemia The limits of this defect were accentuated by a fatally excessive absorption of an anthelmintic drug, which, under ordinary circumstances, is sparingly absorbed It is our purpose to describe the case and to point out a potential danger in the treatment of this disease

Clinical History

A 68-year-old woman was admitted to Kuakini Hospital on June 13, 1960, with the complaint of abdominal discomfort She had been well until two months prior to admission, at which time she developed vague abdominal discomfort associated with moderate distention She also noted profound weakness, with stools, light in color, bulky, and foul smelling

Physical Examination—Blood pressure was 106/66 mm Hg, temperature 97 8° F (36 6° C), pulse rate 80 per minute, and respirations 20 per minute The abdomen was distended but there were no definite masses

Laboratory Studies—The hematocrit was 40%, hemoglobin value 13 3 Gm %, white blood cell count 10,400 per cubic millimeter, with a differential count of 7% stab cells, 72% neutrophils, 19% lymphocytes, 1% monocytes, and 1% eosinophils There was toxic granulation of the neutrophils The platelet count was within normal limits Findings of urinalysis were a specific gravity of 1 013, albumin, negative, sugar, negative, white blood cells 3 to 5 per high-power field, and red blood cells 6 to 8 per high-power field The prothrombin time was 58% of normal, total serum protein level 4 8 Gm % (albumin, 2 8 and globulin, 2 0 Gm %), calcium, 8 3 mg%, phosphorus 3 4 mg%, and the alkaline phosphatase level 5 (Bodansky) units Electrolyte values were potassium, 3 0 mEq/l, natrium, 152 mEq/l, chlorine, 110 mEq/l, and carbon dioxide, 29 mEq/l Glucose tolerance readings were 97, 204, 244, 247, and 141 (three-hour test) Findings of gastric analysis were absence of free hydrochloric acid after histamine Large numbers of *Strongyloides* adults, larvae, and eggs were seen (Fig 1) The sweat sodium content was 61 mEq/l and that for chlorides, 85 mEq/l The stools were positive for *Strongyloides* and negative for enteric pathogens The total stool fat was 120 Gm in 72 hours

X-ray Studies—Roentgenographic studies revealed slight antral gastritis but no ulceration There was some delay in emptying The bulb and doudenal loop were enlarged and showed no intrinsic organic obstruction There were hypomo-

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From the departments of pathology and medicine, Kuakini Hospital tility of the small bowel and flocculation of the barium The jejunal transit time was slower than normal The normal mucosal pattern was lost

Course in Hospital

The patient was given dithiazanine iodide, 100 mg, at 2 p m, June 17, 1960 A second 100-mg dose was given at 4 p m, and at the same time she was given 100 mcg of (vitamin B_{12}) Dodex She was given a third 100-mg dose of dithiazanine iodide at 9 p m on the same day The next day, June 18, she was given three 200-mg doses of dithiazanine iodide at eight-hour intervals There were no complaints until noon on that day, at which time the patient stated that she had a 'funny feeling" Her eyes were staring, and she complained that she could not see, although she could identify a hand when it was placed before her eyes She was lethargic and sweating Her blood pressure at this time was 110/64 mm Hg She evacuated a large quantity of soft, watery stool at this time Another stool was passed in two hours At 3 p m, she vomited 200 cc of watery bluish material The vomiting was projectile in type Her blood pressure now was 100/58 mm Hg She was placed on oxygen therapy An electrocardiogram taken at this time showed sinus tachycardia (100 per minute) At 3 30 p m, her blood pressure had fallen to 72/50 mm Hg She now vomited 100 cc of greenish material At 4 15 p m, an intravenous infusion was started The was composed of 1,000 cc of 5% glucose in saline solution, with 40 mEq of potassium chloride Levarterenol (Levophed) bitartrate was added to the intravenous infusion at 4 30 p m, and the blood pressure rose to 100/92 mm Hg She was now also given 200 mg of trimethobenzamide hydrochloride (Tigan) The blood pressure, for the next six hours, fluctuated between 90/40 to 110/80 mm Hg At 10 55 p m (June 18, 1960) she was given 100 mg of hydrocortisone intravenously, and an additional 100 mg was added to the fluids given intravenously She was given 1 Gm of chloramphenicol intramuscularly One and one-half hours later she was given 25 mg of prednisolone intramuscularly At approximately 12 30 a m on June 19, 1960, her blood pressure again began to drop and fell to 50/40 mm Hg, in spite of continued administration of levarterenol An additional 100 mg of hydrocortisone was added to the intravenous fluids at 1 45 a m By this time, the patient had very labored respirations and was stuporous She died on June 19, 1960, approximately 15 hours after the onset of her terminal symptoms

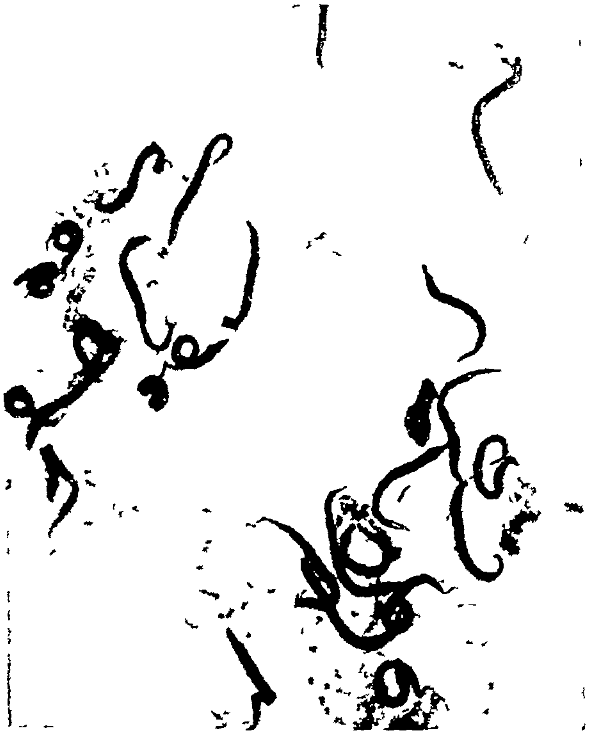

Fig 1 —Photomicrograph of smear of gastric aspirate, showing masses of parasites (× 120)

Necropsy Findings

Gross Findings —The most striking change noted on gross inspection of the body was an intense color change in the various abdominal viscera The lymphatic channels of the intestine and stomach were distended with blue dye The periesophageal lymphatic channels were dilated and plugged with dye to the level of the pharynx The liver, the pancreas, the kidneys, and the lymph nodes were bluish-green The lumen of the gastrointestinal tract contained blue dye The duodenum and proximal jejunum were dilated There were no gross areas of mucosal ulceration The retroperitoneal tissues at the upper margin of the pancreas contained an area of confluent ecchymoses measuring 5 cm in diameter The lateral segment of the middle lobe of the right lung contained a group of dilated, mucus-filled bronchi, and the anterobasal segment of the lower lobe of the right lung contained a firm gray nodule in the subpleural aspects This had a lobular configuration and measured 1 cm in diameter Otherwise, the findings were essentially normal

Microscopic Description —There was pronounced, uniform dilatation of the capillaries and venules The mucosae of the *stomach, duodenum,* and *jejunum* were intact The glandular crypts contained strongyloid parasites (Fig 2) The villi of the jejunum were swollen and club-shaped The basal segments of the glands were distended with mucus and contained occasional neutrophils The lamina propria of the upper gastrointestinal tract showed marked edema Its capillaries and venules were markedly dilated The tissue contained large numbers of neutrophils, eosinophils, plasma cells, and nuclear fragments (Fig 3) Filariform larvae were noted in the external muscle coat of the *large intestine* A few of the sinusoids in the *liver* were focally dilated and contained clumps of neutrophils The *mesenteric lymph nodes* contained distended sinusoids filled with lymphocytes, monocytes, eosinophils, and plasma cells The basic architecture of the *Pancreas* was well preserved The acini contained secretory granules Some of the capillaries were plugged with neutrophils and had pink, fibrinoid walls The surrounding connective tissue contained collections of neutrophils and extravasated red blood cells (Fig 4) The small firm area noted in the anterobasal segment of the lower lobe of the *right lung* was found to be a granuloma caused by *Torula histolytica* The remainder of the pulmonary tissue was well aerated The septal capillaries in the posterior portions of the lower lobes were dilated The spleen, thyroid gland, adrenal glands, pituitary gland, kidneys, heart, and brain showed no significant histological changes

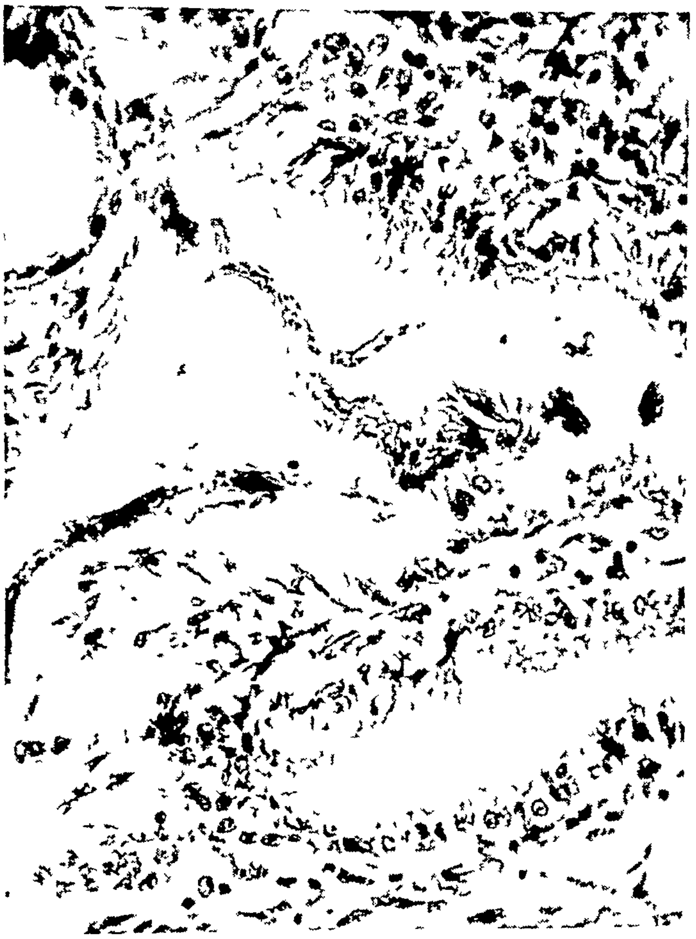

Fig 2 —Photomicrograph of section of gastric mucosa, showing parasites in glandular crypts (× 265)

Comment

There have been few observations that noted the association of intestinal malabsorption with *Strongyloides* infestation Jones and Abadie,[1] in a study of the clinical manifestations of the disease, observed that abnormalities of the feces, other than fluidity, were unusual unless associated with diseases which could better account for these abnormalities The presence of blood in the feces was the most conspicuous additional fecal abnormality Most textbooks and papers covering the fields of parasitology, tropical medicine, and gastroenterology omit any reference to sprue-like symptoms in strongyloidiasis Huchton and Horn [2] reviewed the clinical findings in 16 cases and noted that only one patient in their series carried a differential diagnosis of celiac disease but did not furnish the pertinent laboratory findings There is radiologic evidence, however, that the upper gastrointestinal tract shows changes similar to those seen in sprue Paterson [3] reported one case in which the jejunal mucosa lacked the usual feathery pattern The jejunum had the pipestem appearance that is usually associated with ulcerative colitis, and the jejunal transit was slow Paterson also called attention to the fact that radiologic abnormalities of the small intestine were frequently seen in patients with *Strongyloides* infestation and that these are closely associated with the malabsorption of essential foodstuffs Rivas-Gomez,[4] in a study of 52 cases, noted hypotony and hypokinesis of the valvulae conniventes, fragmentation of the barium meal, especially in the jejunum, and segmental stenosis of the small intestine He believed that the changes in 14 cases were the same as those seen in instances of intestinal malabsorption The present case also showed slow jejunal transit, fragmentation of the

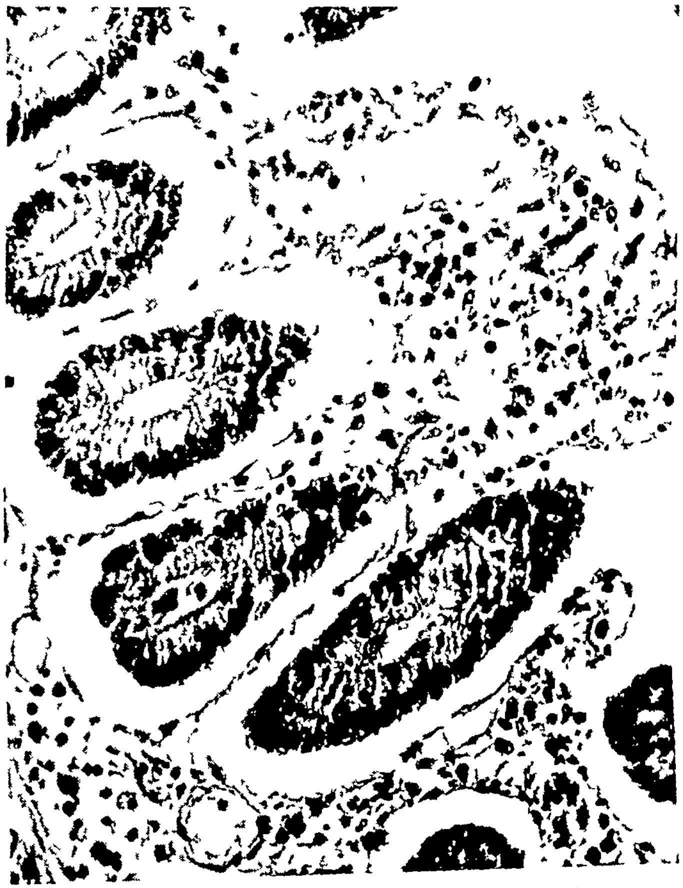

Fig 3 —Photomicrograph of section of jejunal mucosa, showing edema and inflammation of lamina propria (× 265)

barium meal, and loss of the usual mucosal pattern, with defect in the absorption of fat

Strongyloides stercoralis is a notoriously difficult parasite to eradicate A new anthelmintic, dithiazanine iodide, has recently been shown to be fairly effective in this regard The drug is a blue cyanine dye Cyanine dyes are sparingly soluble and poorly absorbed from the gastrointestinal tract The high levels in the intestinal tract after oral administration of dithiazanine exert an inhibitory effect on the anaerobic metabolic reactions of intestinal helminths Cure rates for *Strongyloides* range from 62 to 100 per cent Serious toxicity has not been encountered or reported during the clinical trials with this drug Nausea, vomiting, anorexia, cramps, and diarrhea have been reported and attributed to a local irritant effect upon the gastrointestinal tract Since cyanine dyes, as a class, are highly toxic when given parenterally, it has been stated that it should not be given in any condition in which its absorption might conceivably take place[5]

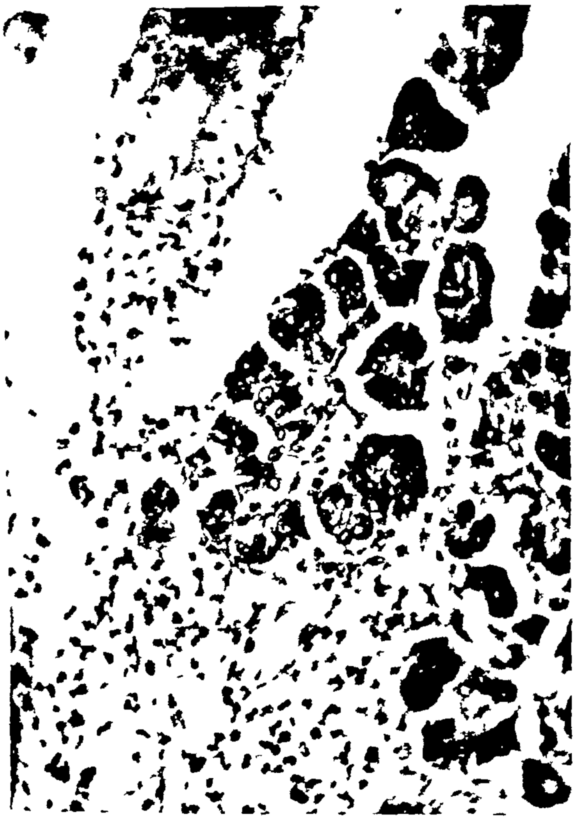

Fig 4—Photomicrograph of section of pancreas, showing inflammation in wall of capillary and surrounding interstitial tissue (× 265)

In spite of the evidence of a malabsorption syndrome in the present case, there was obviously no impediment to the absorption of dithiazanine It is well known that there is a marked variation in the absorption pattern in patients of this type Although steatorrhea is almost always present to some degree, water and its solutes may be unaffected until a fulminating episode Even so, it is paradoxical that this medicament should have been rapidly absorbed when, under ordinary circumstances, it owes its usefulness to the fact that absorption does not occur The reason for this unusual event may possibly be found in the pathological changes in the diseased gut Recent studies of the anatomic changes in the small intestine mucosa in patients with sprue have shown consistent inflammation of the lamina propria and clubbing of the villi[6-7] These changes were present in an extreme degree in the present case They can be accounted for on the basis of parasitic infestation and may explain the fat-absorption defect Dye particles, however, may have been picked up due to phagocytic activity and carried to the lymphatic channels and capillaries This mechanism would be favored by the slow transit time of dye through the upper intestine It would appear dangerous to use this drug if heavy strongyloid infestation is complicated by clinical and radiologic evidence of the malabsorption syndrome Appropriate clinical and radiologic studies are essential

Summary and Conclusions

A case of *Strongyloides stercoralis* infestation presented as a malabsorption syndrome The patient died of peripheral shock after receiving a comparatively small quantity of dithiazanine iodide The drug is a cyanine dye which, under ordinary circumstances, is sparingly absorbed In the present case, however, there was visual evidence of the dye in lymphatic channels of the gastrointestinal tract

The unexpected absorption of this drug is explained on the basis of increased vascularity of the inflamed gastrointestinal mucosa, combined with a slow transit of the dye through the intestine It is recommended that dithiazanine not be used in patients with heavy strongyloid infestation until the presence of a malabsorption defect has been ruled out

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Role of the Family Physician in Preparing a Patient for Surgery

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THE family doctor of today plays a significant role in the management of any patient facing surgery. Details of activity vary from community to community, and his duties in a rural or smaller population area will be different from those of his colleague in a metropolitan setting. Regardless of where they practice, the *philosophies, perspectives* and *attitudes* of all family doctors will be the same.

Who and What Is a Family Doctor?

This may seem a trite question. However, I believe it merits more than a simple answer. He is usually a general practitioner who knows a particular person well and, in turn, is well known by this person. You will note that I have used the word "person" rather than "patient." This word indicates a unique rapport between patient and doctor, and it is this one characteristic typical of every good family doctor that merits greatest emphasis. In brief, the family doctor is the one about whom the patient refers when he speaks of "his doctor" and the man on whom he leans for understanding, trouble shooting, guidance, and information on any and all facets of his experience. He looks to his family doctor for help and hope, in short, he usually feels but doesn't often say, "You are my one friend in this frightening and mysterious experience. Please stick by me!" Those of us who have undergone a serious illness or surgical experience know exactly what I mean, if we were fortunate to have had such a man helping us.

In some geographical areas, one's family doctor will be the whole team—surgeon, internist, psychiatrist. However, I am not considering this type of situation in this paper and shall comment no more about it.

Rather than limit my remarks to preoperative evaluation and preparation, I wish to review, briefly, the continuing role of the family doctor throughout the entire surgical experience, since when presented in only this perspective does it take on its true importance. His work begins with the detection of a problem requiring surgery, it continues as he completes preliminary studies and helps his patient select a hospital, surgeon, and other indicated consultants. His duties increase as he supports, consults with, and assists each member of the team of experts brought into the management of the case from its preoperative through its postoperative phases. His role ends only when his patient has returned to work and good health or, occasionally, when he dies.

Since he knows a patient well and, in turn, is well known by this patient, the family doctor's role as a member of the attending hospital team is one of major significance to the patient and his family. From the moment he detects a problem requiring surgery, through preliminary studies, admission to the hospital, selection of a surgeon, definitive studies, surgery, and postoperative care, the family doctor has definite responsibilities. He supplies information and observations peculiar to this one person and acts as his patient's personal consultant to all other attending men. He communicates the many facets of scientific information developed in the definitive management of the case to both patient and family in meaningful language. He must bring understanding to both patient and family in a highly personalized manner in a setting that often is too impersonal.

What Is it Like To Be a Patient

Here is one question each of us who cares for sick people should ask himself as he goes about his work. I would like to share a few of my own reactions as I faced and went through two major surgical experiences, since I believe each of us thinks,

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Past-president, Ohio Academy of General Practice.

Read before the Section on General Practice at the 109th Annual Meeting of the American Medical Association, Miami Beach, June 14, 1960.

feels, and acts very much the same when we become patients I am sure that every patient is frightened, insecure, suspicious, and quite lonely as he thinks about his approaching operation Not only is he upset, his family too becomes involved Diagnostic and therapeutic procedures increase his discomfort and concern Both patient and family need a staunch friend From having an intern jab both arms hunting veins, through a sigmoidoscopic examination or enduring the pain of a distended bladder needing catheterization, the hospital stay becomes an eye opener when you are the patient As you try to analyze the significance of your disease, especially, when your doctors say too little or too much, you tend to become confused It is easy then to misinterpret At this time you need reassurance I believe most patients react like this Each of us becomes a better and much more understanding doctor after having been a surgical patient

Preoperative Responsibilities

Each family doctor will have his own unique pattern of activity in taking his patient through surgery A preliminary working diagnosis must be established, showing the need for hospitalization Adequate history, physical survey, and screening laboratory studies are essential to make the patient receptive These cannot be over emphasized Following this workup, a thorough discussion of the problem with the patient and those of his family requiring such information will orient and brief both on what will happen to him in the way of more studies, examinations, laboratory procedures, and consultations during the definitive workup *If this briefing is done well, it will preclude much fear, confusion and many misunderstandings*

The surgeon and attending staff personnel must be oriented also on all essential features of the case during the definitive workup This will preclude duplication, time lags, and misunderstandings which irritate patients I personally like to use the Consultation and Referral Form developed by the American Academy of General Practice It is a most effective way to present essential history, physical, laboratory, emotional, financial, and other significant factors

Special details of present medication, past allergies, previous emotional reactions to stress, likely cooperation or interference by members of the family, financial worries of the patient—all should be noted clearly It should be noted when patients have been maintained on digitalis, diuretics, aminophylline, bronchodilators, cortisone, insulin, thyroid, nitroglycerine, antihypertensives, anticonvulsants, or other agents, otherwise, interns and residents will fail to continue administration of such agents although it may be important they not be discontinued This is especially true when corticosteroid therapy has been used within a six-month period The stress phenomena of surgery requires support with cortisone therapy in these patients for a short time prior to and after surgery

Anesthetic Responsibilities

In a recent article Jacoby[1] and his group at Ohio State reviewed the problem of anesthetic deaths Citing surveys indicating one such death in every 1,000 to 2,000 anesthetics administered, this group feels the family doctor can play a major role in the prevention of operating room fatalities The summary of their suggestions merits emphasis 'Anesthetic deaths occur too often The family doctor can help prevent such deaths by providing the operating team with the benefit of his knowledge of the patient, including diseases which he has had, medications to which he responds in an unusual manner The family doctor can do much to help in preparing the patient so that his physical condition and mental attitude are optimal before he comes to surgery The family doctor can also do much in assuring that the patient *comes to the operating room with an empty stomach,* this alone would cause a substantial lowering of the anesthetic mortality rate He should also see to it that the anesthetic procedure is not begun until the anesthetist has had a chance to *gather and test all the equipment which might be needed* in the event complications arise' These two points are essential to keep in mind when preparation time appears to be short, as in fractures, injuries, and obstetrical cases Denson and Shapiro[2] have emphasized these and other responsibilities of the referring physician in briefing the surgeon and the anesthesiologist on any patient coming to surgery

One final point which I wish to emphasize in the preoperative period is a final visit by the family doctor the day or evening before surgery This is the time to review with the patient and his family the impending surgery Optimism must permeate this visit Every effort must be made to remove fear and dread by explaining the significance of all diagnostic work done to date, reassuring the patient about the anesthetic, emphasizing to him that his anesthetist and surgeon are top quality men and that he—his family doctor—will be following him during his postoperative stay In other words, we must try to get the patient to want his surgery—not fight it or fear it

It is well for all attending and consulting staff men to know that at this time in his experience a patient leans heavily on his "own doctor" The family doctor now becomes more like a supporting friend or member of the family than a skilled physician It makes little difference to a patient how expert and famous his surgeon is, he, the patient, wants to know that his family doctor will be with him to help, whenever he needs help

Operative and Postoperative Responsibilities

Ideally, the family doctor should be present or assist during the surgery In large cities, this is not necessary, but in any situation the family needs his service at the time of surgery, especially if the stay in the recovery room is to be long If present at surgery, he can reassure the family early, if not present, he should arrange to have a resident or intern see the family as soon after surgery as possible Later in the day, the family doctor should visit his patient, review the findings with the staff, and discuss them with the family

Here is a point of great value *In the dim consciousness of the immediate postoperative period, the memory of the family doctor's reassuring words means much to any patient*

Today, everyone has one outstanding fear—that his trouble is due to cancer The first thing every family wants to know is that no cancer was found or, if found, it was all removed The patient and his family will believe only one person, the family doctor It makes no difference who the surgeon was, as stated before, it is the family doctor they believe If cancer is not present, both patient and family should be reassured emphatically If it is found, the family doctor is probably the best person to discuss this with the patient and his family Judgment in when to discuss this, how to do it, and what words to use is imperative if courage, hope, and a desire to go ahead is to take place Having had cancer myself, I can assure you this is not the easiest disease to accept

Continued visits will keep the patient and his family oriented on his progress These visits must be more than the usual head-in-the-door remark, "You're fine today!" In most teaching hospitals, everyone is being taught by someone except the patient Too often, the patient becomes the forgotten man Yet he is the one person most vitally interested in what has happened, is happening, and will happen to him Here is where the family doctor can play his finest role—that of teacher for his patient

Any surgeon who has had the services of a well-trained, industrious, and dedicated family doctor will want this man as his consultant whenever he operates on one of his patients And every patient who has a family doctor in whom he has confidence will want him to participate in his care throughout the surgical experience Both men need each other, and I want to suggest that each surgeon urge any patient who comes directly to him from another specialist to have his family doctor participate actively in his care

I have not even mentioned the many scientific studies, evaluations, and recommendations developed in the definitive preparation of the patient since other consultants often participate in this activity Each supervises important aspects of preparation Our responsibility as family doctors is to understand what each is doing when brought into any particular case, assist him and relate the significance of his work to the patient and his family

Return Home and Convalescence

The final part we play needs little comment Early ambulation means that more people are going home to develop complications such as drainage from wounds and reactions to chemotherapy Surgeons often forget to provide for sedatives, hypnotics, pain-killers, and other medicaments consistent with the patient's need

We should see each patient either on the day prior to discharge or within 24 hours after discharge to review discharge instructions and check discharge prescriptions May I point out here that no intern or resident seems to know the high cost of prescriptions to patients, or else they would never prescribe the huge quantities of expensive medicines they do

It would seem unnecessary to mention that every surgeon should send the family doctor a complete hospital discharge summary as soon as possible after the patient leaves It is as much an error for the surgeon to fail in this responsibility as it is for the family doctor to omit informing the surgeon of essential facts about the patient when the latter is admitted The discharge summary makes it possible for the family doctor to review the entire experience, clear up any questions or doubts the patient or his family may have about the operative findings or pathological reports Again, may I emphasize how hard it is to remove completely the fear of cancer from every mind Usually, this final written report helps greatly and often terminates the fear completely

Follow-up visits to see the surgeon should be coordinated with the family doctor No surgeon should set up such visits without first discussing this with the patient's family doctor Here is an area in which there need be no conflict if both men integrate and coordinate their continuing roles All surgeons will want to see cancer patients at periodic visits in order to maintain an accurate follow-up study It would be helpful, too, if the family doctor would notify the surgeon whenever the patient appears to have a recurrence of hernia, gallstones, or surgical failures of any type Here again, interest and cooperation by the family doctor makes possible adequate follow-up studies

Human Relations in the Sick Room

Many times the difference between a satisfying or an unsatisfying memory of a surgical experience is the presence or absence of one's family doctor This is particularly true when a patient is sent to a distant city for study and care in an outstanding clinic or hospital The impersonal atmosphere and manner, often so characteristic of these settings, leaves a bad impression in the mind of the patient What a shame it is to realize that some of our finest scientific knowledge and skill is being applied with so little artistry and meaning I am sure each of you know of many such experiences

The family doctor, more than other attending personnel, identifies himself with patient and family and attempts at all times to maintain a warm, understanding, and sympathetic relationship

The family doctor, however, should not be the only one who tries to understand and look on the patient and his family as human beings needing friendship and kindness—every one in the hospital setting should relate himself in a like manner We must give more than lip service to the art of medicine I mentioned earlier that patients are fearful, suspicious, doubtful, sensitive, anxious, and often lonely Trying to appear calm and unworried, they often joke and seem to appear gay Underneath, however, they are deeply worried When in this state of mind their greatest need is to feel close to those around them Each person in the hospital setting becomes important to the patient, because he believes each one knows something about him Whether it be the cleanup girl, an intern, a nurse, or an attending physician, the patient needs to identify strongly with optimistic, kind, understanding, and supportive people *There is no more effective medicine than kindness nor is there any substitute for it* It is an essential ingredient in all human relationships When one is frightened and lonely, a cold, disinterested and indifferent attitude on the part of attending personnel can be devastating

A patient needs to know what is going on and why it is going on It is not important to know too much detail of any procedure but it is important to interpret what and why such a thing is being done to or for the patient This lessens fear and misinterpretation by the patient, and he will usually make such misinterpretation if not informed correctly by other personnel To be handled with indifference, lack of common courtesy and on an impersonal basis keeps the patient frustrated and not a participant in a procedure

Paying attention to what a patient says or complains of is important Often, we assume the patient is unreasonable, uninformed, and in no way capable of accurately knowing what he needs This may be true at times but often the patient is very much aware of things needing attention It is most important for everyone to listen patiently and try to understand, then check on the particular complaint or comment Anyone with a full bladder which needs catheterization knows the agony of being told to wait another hour to see if he can urinate The extreme discomfort of a bowel impaction, the postnasal irritation of a tube into the stomach, repeated venoclyses in veins, some of which are clogged, the aching of an arm held on a splint for hours while blood or fluids run slowly—these are just a few of the experiences that merit close attention on the part of attending personnel A few words of explanation, an effort to encourage and even try to give some comfort by occasionally discontinuing a procedure, may be worth everything to the patient *Most important, however, in these situations is the attitude of those attending the patient* To be ignored or ridiculed adds only to one's discomfort and frustration and this might interfere seriously with one's progress

It is my firm conviction that attending and consulting physicians are the key persons concerned with demonstrating and developing a high degree of artistry in patient care No other person in the hospital setting can substitute for the doctor in the eyes of the patient, so it is essential that we doctors accept, then carry out our responsibility in this area with wisdom, understanding, and an ability to show our patients we really are interested in them *as people with diseases rather than just diseases*

Summary

A family doctor plays a significant role when one of his patients undergoes surgery He is the one physician who knows a person well and is, in turn, well known by that person His role is the only continuing one of major significance to the patient and involves far more than preoperative preparation Throughout the experience, from his detection of a problem requiring surgery to preliminary studies, admission to the hospital, selection of the surgeon, definitive studies, surgery and postoperative care, he keeps his attention focused continuously on the person undergoing surgery He acts as consultant to all other attending men, completes and records certain essential studies and observations, then coordinates and integrates the many facets of scientific information developed in the definitive study and care of his patient He communicates this information to his patients and his patient's family in meaningful language and accepts full responsibility for convalescence and rehabilitation The family doctor should correlate with the surgical picture for the sake of the patient and his family, the surgeon, and anesthesiologist, and to make the whole experience efficient, smooth, and satisfying

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Paralytic Brachial Neuritis

Discussion of Clinical Features with Review of 23 Cases

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A series of 23 patients with paralytic brachial neuritis is reviewed It is noted that there is a higher incidence in men than in women, etiology is unknown This syndrome is not uncommon and frequently is diagnosed incorrectly The onset is sudden, with severe pain along one side of the shoulder girdle, followed in a few hours or days by atrophic paralysis of muscles over the affected shoulder, the disorder is occasionally bilateral The pain usually subsides within a few days or weeks, but the paresis persists for months or even years Prognosis is usually satisfactory for the return to good function, but recovery for customary physical activities is usually slow Mild sensory loss may be present

A SPECIFIC FORM of brachial neuritis was described in 1943 by Spillane[1] under the name of "localized neuritis of the shoulder girdle" Similar cases, although designated under various terms, had been described by Richardson,[2] Burnard and Fox,[3] Brain,[4] and Wyburn-Mason[5] One of the largest series of patients with this disorder and most detailed reviews of the problem was reported by Parsonage and Turner[6] in 1948 They further amplified the clinical features of the syndrome and suggested the name "neuralgic amyotrophy" for this particular type of neuritis Although this disorder has received little attention in the American literature, it has been found to occur regularly in the United States Because many physicians are unfamiliar with this syndrome, it has been confused with poliomyelitis, spinal-cord tumors, ruptured intervertebral disks in the cervical region, cervical spondylosis, and degenerative diseases such as amyotrophic lateral sclerosis

This paper presents the clinical features and analyzes the signs and symptoms in a series of 23 patients with this type of brachial neuritis The number of patients reported would be larger had the disorder been recognized properly Many cases were presumably diagnosed as poliomyelitis, spinal-cord tumor, or degenerative disease A review of all of the records of patients at the University of Michigan Medical Center with these various diagnoses would have been impractical The present series is, however, quite representative We believe that an increased knowledge of this relatively benign disorder will result in a wider recognition of it and avoid confusion with more dire disease

The clinical features are consistent and usually simple to recognize An individual develops severe pain about one (or occasionally both) shoulder girdles, the side of the neck, and the upper arm At the onset the pain is usually severe but generally subsides within a few days Within hours or days after the onset of the pain, weakness of muscles about the shoulder girdle develops This weakness may vary in degree but is on the same side as the pain The paresis lasts weeks or months, usually with slow recovery, occasionally the paresis may persist longer or be permanent The paresis is of the lower-motor-neuron type, fasciculations are uncommon Atrophy of the weak muscles commonly develops in proportion to the degree and duration of weakness Cutaneous sensory loss may occur, but it is usually mild in comparison to the severity of the motor involvement The pattern of motor and sensory loss may follow the distribution of one or more peripheral nerves, nerve roots, or combinations of both—a radiculoneuritis Apparently patients of any age and either sex may develop the disorder, but it is more common in males

Case 1 is typical of the disease Although there are variations to this typical history, the basic features—severe pain in the shoulder which subsides within a few days or weeks followed by paralysis and atrophy of muscles about the shoulder girdle persisting for months or years—are consistent

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From the Department of Neurology, University of Michigan Medical Center

Report of Cases

CASE 1—A 28-year-old man developed a mild upper respiratory infection in November, 1957 This cleared in three to four days One week later, however, when the patient thought that he was again in good health, he awoke at 6 a m with severe pain and tenderness in the left shoulder and the inner aspect of the left arm to the elbow Administration of codeine was necessary to give partial relief of pain Within seven days the pain subsided, although the patient noted that his shoulder was very weak He could not definitely ascertain the time at which the weakness began because the severe pain had prevented shoulder movement As the pain subsided the weakness became increasingly apparent Within four days, the weakness was maximal Neurological examination at that time disclosed severe paresis of the left deltoid, supraspinatus, infraspinatus, and serratus anterior muscles Slight atrophy was apparent in the left suprascapular and deltoid areas No fasciculations were noted A small area of hypesthesia and hypalgesia was present over the outer surface of the arm in the distribution of the axillary nerve Roentgenograms of the cervical spine, cerebrospinal fluid examination, and myelogram showed normal findings The patient's condition did not change for the next three months At this time slow but continuous improvement began Reexamination at the end of one year showed no residual weakness or sensory change

CASE 2—A 52-year-old man, apparently in good health in April, 1958, suddenly developed an 'aching" pain in the right deltoid area Within several hours, a similar pain developed over the left shoulder Two days later, he noticed weakness of the right shoulder and of the left wrist and fingers He reported that the weakness began in both extremities at approximately the same time The pain subsided within three days, but weakness persisted, although it did not become more severe after the first day

Neurological examination three months after the onset of the symptoms disclosed weakness and mild atrophy of the right deltoid, supraspinatus, infraspinatus, and serratus anterior muscles Extension of all the fingers and the wrist on the left was also paretic, as was abduction of the thumb Slight paresis was also evident in the left deltoid and biceps muscles Hypalgesia and hypesthesia were found in an area conforming to the axillary-nerve distribution on the right and the radial-nerve distribution on the left

Roentgenograms of the cervical spine showed mild arthritis at C-3 to C-4 but otherwise showed normal findings A cerebrospinal-fluid examination, made three months after the onset of symptoms, disclosed a total protein level of 51 mg per 100 cc but revealed normal findings otherwise

During the fourth month of the illness, slight improvement began The patient was followed to the time of this writing (one and three-quarters years) His recovery was nearly complete at that time

CASE 3—This patient, a 36-year-old lawyer, was seen recently and therefore is not included in the over-all analysis of the cases Two years ago, 10 days after an appendectomy, he developed pain about the right shoulder girdle and a patch of numbness in the axillary-nerve distribution on the right Within a day, profound weakness of the shoulder girdle developed The pain left within 10 days, but the weakness remained stationary for about three months Slow improvement then began The patient stated that he regained full strength in the shoulder one year after onset of symptoms Nearly two years after the symptoms began on the right side, when the patient was in apparent good health, he suddenly developed severe pain about the left side of the neck and shoulder girdle Two days later, he developed paralysis of the left shoulder girdle Examination two weeks after the onset of symptoms disclosed severe paresis of the left deltoid, supraspinatus, and infraspinatus muscles and milder weakness of the left triceps and biceps The right deltoid muscle was slightly weak, otherwise, there was no residual of the previous right-shoulder-girdle paresis Pain subsided within 10 days after the weakness began on the left After three months' observation slight improvement in strength was noted

Clinical Features

Age and Sex Incidence—It was of interest that 21 of the 23 patients in this series were male The youngest patients were ages 8 and 9 years, the oldest was 64 years The most common age of onset was during the third through the sixth decades, the majority of the patients were scattered fairly evenly throughout this age range Some of the other large series of cases were reported in military personnel, these, of course, show high incidence in men It is of interest that male predominance is also found in this random civilian series

Antecedent Illness—In this group of 23 patients, only 7 had had any medical disorder immediately preceding the onset of the neuritis Five patients had mild upper respiratory infections One patient had been receiving treatment for neurodermatitis for two months Another patient complained of fatigue for several days preceding the onset of the neuritis, but no specific cause for this was found No patient had experienced recent trauma to the neck or upper extremity or had recent serum injections

This is a lower incidence of antecedent illness than Parsonage and Turner reported[6] They found that nearly half of their patients were in the hospital with other conditions when the shoulder-girdle syndrome started Association was noted with, or during convalescence from, such acute infectious diseases as malaria, typhus, typhoid, and dysentery Other cases followed relatively minor operations, trauma, lumbar puncture, and pneumoencephalography There was apparently no common denominator to these antecedent disorders except that the patient's health could not be considered "excellent" at the time the shoulder-girdle syndrome began Spillane[1] also noticed the tendency for the disorder to begin when the patient was in the hospital convalescing from some other illness, but again he found no common factor of etiological significance

Mode of Onset—There were no constitutional symptoms and no fever at the time of onset In all our patients, the initial symptom was pain This pain was usually severe and commonly described as "boring" or "aching" Its usual location was about the shoulder, but radiation to the side of the neck and throughout the upper arm was not infrequent Movement of the shoulder aggravated the pain Muscle soreness in the painful areas was common The pain occurred on the left in 8 patients and the right in 12, bilateral symptoms were present in 3 patients In the latter, the symptoms began first on the right in two cases and the left in one, followed by involvement of the other side in two hours, four days, and six days, respectively There was no relation between side of involvement and whether the patient was right-handed or lefthanded

Seventeen patients stated that the pain was maximum at the very onset The other patients noted some progression in severity of the pain, which reached its maximum in between one and three days Pain subsided within 24 hours after its onset in four patients, within the first week in nine patients, within the second week in seven, and within the third week in two patients One patient complained of continued mild pain for seven weeks

TABLE 1—*Interval Between Onset of Pain and Appearance of Paralysis in Twenty-Three Patients with Paralytic Brachial Neuritis*

Interval, Days	Patients No
0	2*
<1	2
2 3	7
4 5	4
6 7	4
8 9	2
10 14	1
14 21	1

* Onset of pain and of paralysis occurred simultaneously in these patients

The history in our patients was similar to that in other series where severe pain usually came on suddenly, lasted from hours to a week or two, and then subsided, an occasional patient noting dull soreness or pain which persisted for a month or two

Paralysis—Paresis or paralysis developed in all patients, and the time of its appearance ranged from the day of onset to 21 days after the onset of the pain The average duration between the onset of pain and the beginning of paralysis was three to six days Two patients claimed that the weakness developed at the same time as the pain The varying times of onset of paralysis are shown in table 1

TABLE 2—*Time Between Onset of Paresis and Maximum Severity in Twenty-Three Patients with Paralytic Brachial Neuritis*

Interval Days	Patients No
0	7*
<1	3
2 3	4
4 5	3
6 7	4
10 14	2

* Paresis was most severe at the time of onset in these patients

The interval between onset of pain and paralysis is, however, somewhat unreliable since the patients frequently did not notice the exact beginning of weakness because the pain prevented use of the shoulder Therefore, it was frequently reported that paresis was noted as the pain subsided This also falsely suggested progression of paralysis, for as the pain decreased efforts to use the arm increased and weakness became more apparent Nevertheless, table 2 notes the time during which the patient thought his motor disability was progressing

Atrophy and decreased reflexes correlated with the degree, location, and duration of weakness Fasciculations were not common but were observed in paretic muscles in three patients

Table 3 lists the frequency of involvement of various muscle groups in this series In general, it can be noted that the musculature of the shoulder girdle was most commonly affected Elbow movements were involved in a lesser number of patients, while wrist paresis was least common Considering that, in this series of 23 patients, 3 patients had bilateral symptoms, this table analyzes weakness in 26 instances

It is evident that deltoid-muscle paresis was the most frequent finding, closely followed by weakness of supraspinatus and infraspinatus muscles The combination of weakness of these three muscles was common

In general, weakness conformed to several patterns 1 Weakness may be limited to the muscles supplied by a single peripheral nerve 2 More commonly, combinations of peripheral-nerve involvement may occur—a mononeuritis multiplex

3 The weakness may be limited to muscles supplied by one or more nerve roots, C-5 to C-6 or C-6 to C-7 most commonly 4 Both peripheral-nerve and radicular involvement may occur in the same patient—a radiculoneuritis This was particularly true when sensory changes were also considered Although the pattern of weakness and atrophy might conform to a radicular distribution, the sensory change might be peripheral in type and, conversely, sensory loss might be radicular when motor weakness was of peripheral-nerve distribution These observations conform well to the other cases reported in the literature

Table 3—*Incidence of Weakness in Various Muscles in Twenty-Three Patients with Paralytic Brachial Neuritis*

Muscle or Muscle Group Involved	Cases No
Deltoideus	23
Supraspinatus	19
Infraspinatus	21
Serratus anterior	4
Lower trapezius	2
Latissimus dorsi	1
Pectoralis major	2
Biceps	10
Tricep	9
Brachioradialis	3
Extensor pollicis longu	1
Pronators	4
Supinators	4
Wrist extensors	4
Long extensors of fingers	2

Sensory Findings—Objective evidence of cutaneous sensory impairment was found in 16 patients The most frequent change was a small area of hypesthesia and hypalgesia on the outer side of the arm in the distribution of the axillary nerve This was present in 11 patients Sensory loss was noted over the radial nerve distribution in two patients and in three patients followed the pattern of the C-5, C-6, and C-7 dermatomes, respectively Two patients had subjective numbness over a portion of the C-5 and C-6 dermatome in the forearm and hand but showed no objective sensory loss Nine patients had normal sensation As in cases reported by others, the sensory loss was mild compared with the motor disability and rarely bothered the patient

Laboratory Studies—Roentgenograms of the cervical spine were obtained in 19 patients All these examinations showed normal findings except that mild hypertrophic arthritic changes compatible with their ages were noted in three patients

Cerebrospinal-fluid examination was performed in seven patients from two days to four and one-half months after the onset of the illness In only two patients was the lumbar puncture made within two weeks after the onset of the illness In one patient with bilateral symptoms the spinal-fluid total-protein level was 98 mg per 100 cc, with no increase in cells, a myelogram revealed normal results, and this patient has since shown marked improvement In two other patients there was slight elevation of total-protein level (51 and 53 mg per 100 cc) without other spinal-fluid abnormality Complete examination of the spinal fluid in the other patients disclosed no abnormality, with the exception of a questionable serologic reaction (4 Kahn units) in an 8-year-old boy A treponema immobilization test on both blood and spinal fluid showed negative results Myelograms were performed on three patients and showed normal findings in all

Virus studies in five patients failed to disclose evidence of current poliomyelitis infection However, specimens were obtained in only two patients in proper time relation to exclude poliomyelitis as a possible etiology for this syndrome

Bilateral Cases—Three patients had bilateral symptoms Case 2 is illustrative of such cases In such bilateral cases, pain and weakness may begin on both sides at the same time or several hours or days may elapse before involvement of the second side Paresis may involve similar muscles or may be asymmetrical Aside from the bilateralness, the clinical features and course are similar to those in unilateral cases

Prognosis—Table 4 shows the follow-up period and the functional recovery of the patients during this time

It was noted that recovery may begin within days after paresis has reached its maximum In several cases, however, there was a delay of weeks or months before improvement became evident In this relatively small series, there was no correlation between the muscles involved and the degree of recovery In general, however, it did seem apparent that the more severe and extensive the paralysis, the longer the period of disability Although the prognosis for good functional recovery must be somewhat guarded, it can be observed that the outlook is quite good in the majority of patients

Table 4—*Recovery in Twenty-Three Patients with Paralytic Brachial Neuritis*

Follow-up Period	Extent of Recovery			
	Complete	Good	Slight	None
Mo				
0-3			4	1
3-6	1	3	1	
6-12	2	3	1	
Yr				
1-2		2		
2-3	1	2		
3-4	1			
5-6			1	

Recurrence—Although recurrent cases of paralytic brachial neuritis have been reported by Turner and Parsonage[7] and Dixon and Dick,[8] they are rare We have seen only one recurrence (see case 3)

Differential Diagnosis and Treatment

Paralytic brachial plexus neuritis has been confused with several other disorders Among these, poliomyelitis is a common diagnostic consideration Indeed, it might be claimed that this disorder is but an atypical form of ordinary anterior poliomyelitis Detailed virus studies on a large series of patients have not been done, but clinical findings do not indicate a poliomyelitic etiology for paralytic brachial neuritis

The following points may be emphasized 1 Paralytic brachial neuritis is not seasonal and occurs at any time of the year Furthermore, it does not show increased incidence in areas where poliomyelitis epidemics occur 2 The initial constitutional symptoms and the signs of meningeal irritation are absent in paralytic brachial neuritis 3 Cerebrospinal-fluid examinations, when studied in the acute phase of paralytic brachial neuritis, usually show normal results 4 Although atypical cases of poliomyelitis are common, the uniform clinical picture of paralytic brachial neuritis and its fairly frequent occurrence suggest that it is independent from poliomyelitis 5 Cutaneous sensory change, frequently noted in paralytic brachial neuritis, is rare in poliomyelitis Incidentally, three patients in our series had each received three injections of Salk vaccine

Another common problem is to differentiate paralytic brachial plexus neuritis from a spinal-cord tumor or herniated intervertebral disk in the cervical region If sensory and motor loss correspond to only one or two nerve roots, this may be difficult and myelography may be necessary In general, however, the differentiation is not difficult 1 In paralytic brachial neuritis, the motor loss often suggests peripheral-nerve rather than nerve-root involvement Similarly, sensory change may be peripheral rather than dermatome in distribution 2 Although the initial pain is severe, this subsides and further irritative or destructive sensory changes are minimal or absent It is unusual for a spinal-cord tumor to cause severe pain which is alleviated so promptly, leaving severe motor symptoms with minimal or no destructive sensory alterations

Two patients in this series were thought to have amyotrophic lateral sclerosis The abrupt onset of pain and the rapid appearance of weakness do not occur in degenerative motor neuron disease The lack of progression, absence of corticospinal-tract findings, and the localization to the shoulder girdle further aid in differentiating paralytic brachial plexus neuritis from amyotrophic lateral sclerosis Serum neuritis is excluded by the absence of prior injections of horse serum, although clinically the two syndromes are very similar

There is no specific drug therapy for this disorder Analgesics will be required for pain in the early stages Exercises including a full range of motion several times daily will help prevent periarthritis of the shoulder joint As strength returns, graduated active movement of the paretic muscles should be encouraged Abduction splints were used on several patients with deltoid muscle paralysis but were not necessary for the majority

The etiology of paralytic brachial neuritis is not known Spillane considered trauma a possible etiological factor His series occurred primarily in military personnel In most cases, however, there is no history of injury Considering the many cases that have been reported to follow infectious disease, an infectious etiology seems quite possible, although there is no other evidence to support this

Summary

Paralytic brachial plexus neuritis is not uncommon but has received little attention in the American literature The essential clinical picture consists of the sudden onset of pain in the region of the shoulder or upper part of the arm, followed in a few hours or days by atrophic paralysis of various muscles in this same region, occasionally it is bilateral The pain rapidly subsides, but the paresis persists for months or even years Sensory changes are frequently present but represent a minor part of the clinical picture Over-all prognosis is good for recovery of function of the affected shoulder-girdle musculature The etiology of this syndrome is unknown

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Management of Patients with Spinal Cord Injury

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Problems of treatment and rehabilitation of patients with injuries to the spinal cord are considered in the light of experience with 55 such patients since 1956. Decubitus ulcers, spasticity, pain in the trunk and extremities, and genitourinary infections were the most frequent difficulties. The results varied. Not all patients with spinal cord injuries could be returned to their homes, since the persons and means needed to care for them so often were lacking. Nevertheless, the return to home care and to vocational activity was achieved in some cases with the help of surgery, adaptive devices, physical therapy, and special training. In the rehabilitation team, the referring physician plays an important role.

PRIOR to 1956 Elizabeth Kenny Institute facilities were devoted to the treatment of poliomyelitis patients. Since that time the physical facilities have enlarged and additional medical and paramedical services have been added to comprise a comprehensive rehabilitation unit. The patients are accepted on referral after medical information has been submitted by the physician. On admission of the patient, evaluations are made by various members of the medical rehabilitation team. Performance of activities of daily living is tested and a program of treatment started. At the end of the week, an evaluation conference is held with the referring physician in attendance as a member of the team.

Since 1956, a total of 1,828 patients have been admitted to the rehabilitation service. Fifty-five patients were disabled by spinal cord injuries. Two disabilities were due to malignancies of adjacent tissues compressing the cord, one was caused by an extradural hematoma, and two were caused by occlusion of the anterior spinal artery. In the 55 spinal injuries to be reviewed, 35 were cervical, with complete lesions in 15 and incomplete lesions in 20. Dorsal injuries were found to have occurred in 15 patients, 5 being above T-6, and 10 below that level. Eight lesions were complete and seven were incomplete. The lumbar region was involved in five instances, one being complete and four incomplete. The extent of the lesion was determined during laminectomy in 31 patients. The patients' ages ranged from 3½ to 70 years (Table 1).

Causes of the injuries were as follows: Automobile accidents produced 16 cervical, 5 dorsal, and 2 lumbar lesions. Diving produced 8 cervical lesions. Falls produced 7 cervical, 2 dorsal, and 2 lumbar lesions. Crush forces produced 2 dorsal lesions and 1 lumbar lesion. Gunshot wounds produced 2 cervical lesions and 1 dorsal lesion. Miscellaneous causes accounted for the remainder (Table 2).

The dates of injury ranged from 15 years to 8 days before admission to the Kenny Institute. Thirty-nine patients were admitted from other hospitals less than a year from the time of injury. The remainder had previous hospitalization, including rehabilitation in other centers, and were admitted because of complications, a desire to improve their present status following initial rehabilitation, or for initial rehabilitation where previous facilities were not available.

In a 10-year summary of veterans with spinal cord injuries in Veterans Administration hospitals,[1] the total number of days for patients admitted within two months of injury for further care was 488 for paraplegics and 593 for quadriplegics in the 25-to-34-year age group. In the Kenny Institute series, patients were hospitalized elsewhere for 112 days and remained in the Institute for 350 days, where they had complete cervical lesions. When patients had incomplete cervical lesions, an average period of 70 days was spent in other hospitals and 175 days at the rehabilitation center. Patients who had incomplete thoracic and lumbar lesions were hospitalized elsewhere for 91 days and at the rehabilitation center 136 days (Table 3). Those who

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had complete lesions spent 126 days in other hospitals and 268 days in the rehabilitation center At the time of this writing, there were eight such patients in the Kenny Institute

Readmissions of patients with spinal cord injuries are based on the need for treatment or recheck of conditions related to the spinal cord injury This was done for eight patients on 12 occasions for an average period of 40 days per admission Nine patients were transferred to other hospitals for surgery and readmitted after this to continue rehabilitation

TABLE 1 —Range of Ages in Fifty five Patients with Spinal Cord Trauma at the Elizabeth Kenny Institute

Age Range, Yrs	Patients, No
Under 15	2
15 24	19
25 34	13
35 44	5
45 54	7
55 64	5
65 and over	4

Ischemic ulcers were present on admission in 29 patients Following intensive therapy to improve the metabolic state of the patient, positioning in nonweight bearing of the affected regions, mobilization of the patient, and local treatment healing was accomplished in 16 patients Surgical repair was carried out on two patients In addition, surgical therapy was recommended for four patients, of which two followed recommendations carried out subsequent to discharge, and two declined surgical treatment In the patients with spinal cord injuries presently hospitalized, five have decubitus ulcers in various stages of healing Seven patients had ischemic ulcers which were healed prior to admission, one having had previous surgical treatment The total incidence of decubitus ulcers in all patients admitted was 65%

TABLE 2 —Causes of Spinal Cord Trauma in Fifty five Patients Admitted to the Elizabeth Kenny Institute

	Cervical	Dorsal	Lumbar	Total
Automobile	16	7	2	25
Diving	8			8
Falls	7	3	2	12
Crush Force			2	2
Gunshot	2	1		3
Chiropractic Manipulation (Underlying Osteolytic Lesion)		1		1
Well Drilling Rig	1			1
Football Tackling	1			1
Train and Tractor Impact		2		2

As noted in a report by Nyquist,[2] patients with spinal cord injuries frequently have anemia, and when ischemic ulcers occur the hemoglobin value ranges from 10 to 12 Gm % In addition, the serum protein levels are low This was noted in the foregoing patients Correcting the deficient hemoglobin and protein levels produced marked improvement, not only in the rate of healing of the ischemic ulcers but also in permitting the patient to tolerate mobilization and the standing position in a standing device or on the standing bed The brine bath, containing 5% crude rock salt and 2 5 magnesium sulfate, as recommended by Nyquist, has been a useful adjunct A high-protein diet and local treatment to the ulcers are other routine measures used

Spasticity has been a prominent factor in four quadriplegic patients having decubitus ulcers One patient responded well to instillation of absolute alcohol into the subarachnoid space Spasticity disappeared and the contractures decreased The patient was subsequently referred to his home state university hospital for surgical repair of the decubitus ulcers Another patient had pronounced spasticity, contractures, decubitus ulcers, urinary tract calculi, and infection A similar procedure was recommended in this patient, but this was declined

Tenotomy procedures were done on three patients in whom spasticity was so extensive that contractures could not be managed by conservative means The existence of contractures on admission to the Kenny Institute was noted in 65% of the patients Selective rhizotomies were recommended in three cases, but these were declined by the patients In a majority of patients with spasticity a combination of physical measures, muscle relaxants, and minimizing of sensory, visceral, and somatic stimuli seemed adequate

TABLE 3 —Average Length of Hospital Stay in Days for Traumatic Spinal Cord Lesion

Hospital	Quadriplegia		Paraplegia	
	Partial	Complete	Partial	Complete
Elsewhere	70	112	91	126
Kenny Institute	175	350	136	268
Total Hospital Days	245	462	227	394

Twenty-seven patients complained of pain in various portions of the trunk and extremities Frequently spasticity and pain existed simultaneously In the quadriplegics pain rarely occurred at the site of the fracture dislocation, but was frequently noted in the secondary tightnesses occurring in the shoulders and in the hands Symptoms in the hands were usually consistent with compression of the cervical nerve roots One patient who possessed sufficient power in his upper extremities to propel the wheelchair was unable to do this because of pain in the shoulders and in the hands Conservative physical measures and analgesics were used to control the symptoms One patient who had severe pain in the lower extremities and back, subsequent to a lumbar 2 level lesion, had a tractotomy performed soon after injury Skeletal pain was more commonly found in the low thoracic and lumbar lesions One patient with a lesion at lumbar 3 which involved the lumbar 3 nerve root also had a lumbosacral disk syndrome Conservative measures for pain control have also been used in the thoracic and lumbar lesions

Infections of the genitourinary tract were present in all patients for one or several episodes during the course of the disability Those with incomplete lesions and a moderate degree of recovery upon arrival at the Institute were afebrile Urinary tract calculi were noted in 32% of the patients Nine per cent had urethral damage resulting in stricture, diverticula, or fistulas Seventy-three per cent of the patients on admission had indwelling urethral or suprapubic catheters On discharge, only 42% had catheters The low dorsal and lumbar group had catheters on discharge in 20% of the cases

Satisfactory control of bowel evacuation was more easily obtained In patients who had complete transection of the cord all movements were controlled with suppositories and laxatives Enemas were required in 8% of the cases

Improvements in the performance of activities of daily living are listed under the following categories none, or total dependence, little, for minor self care such as feeding, brushing teeth, typing with an electric typewriter, most, for nearly complete dressing and transfers from the bed to wheelchair, and all, for complete independence

The categories are further divided into incomplete and complete lesions, and cervical, upper thoracic, lower thoracic, and lumbar levels In the cases of cervical lesions, only two patients failed to make improvement from none to little independence In the incomplete lesion group, nine patients achieved complete independence In the complete cervical lesion group, six patients were totally dependent on admission, three had little independence On discharge, five had gained to achieve little independence and one had achieved most self-care abilities With the exception of four patients, all of those with cervical lesions were able to propel a wheelchair In the group with dorsal incomplete thoracic lesions, the patients had been exposed to previous rehabilitation and no change in the categories was noted In the group with complete lesions, one patient improved his status In the cases of lumbar and low thoracic incomplete lesions, five achieved complete independence and nine learned to ambulate with aids In the cases of complete lesions, three patients gained complete independence and three learned to ambulate with aids

Various adaptive devices were used for the quadriplegics The most effective was the extra-articular hook prosthesis, motivated by shoulder girdle action Several patients rejected these, initially, but when these patients observed that others similarly involved were much more functional, they, too, accepted the prosthesis Tendonesis was carried out in two quadriplegic patients Some improvement in function was achieved One patient had an opponens block

Patients who appeared to have some vocational potential were referred to the pre-vocational counselling and work evaluation unit One quadriplegic male patient, 19 years of age, having an incomplete lesion although motor return was minimal, was nearing completion of a course in business administration and accounting at the time of this report Another male patient, 23 years of age, with a complete lesion at T-11, has completed college training in the same field and is returning to work with the same employer Dispositions of the patients were into four areas Ten are, at the time of this writing, in the Rehabilitation Center Twenty-six patients who were in hospitals prior to admission to the Kenny Institute have returned to their homes Seven patients who were at home following initial hospitalization elsewhere and were then admitted to the Kenny Institute on recommendation of the family physician also returned to their homes Seven patients were referred to other hospitals for various surgical procedures, following which they would return to their homes or to nursing homes Five patients were transferred to nursing homes because of lack of personnel and facilities to conduct continuous maintenance care

Because of the growing incidence of permanently disabled patients where comprehensive rehabilitation has been undertaken and where failure of some degree of independence has been noted, continued care is needed in the nursing homes This can best be provided by personnel trained in nursing rehabilitation The Elizabeth Kenny Institute has been engaged in conducting training courses for nurses who are interested in this field

Summary

A review is presented concerning the experiences of the staff of the Elizabeth Kenny Institute in the treatment of 55 patients with spinal cord injuries The referring physician plays an important role as a member of the rehabilitation team Although the patients are seen in the follow-up clinic, either on an inpatient basis because of conditions related to the spinal cord injury, or in the follow-up outpatient clinic, the referring physician is relied upon extensively to be the patient's prime contact The vocational rehabilitation of the quadriplegic patient is rarely successful for other than homebound employment in this locality Not all patients with spinal cord injuries can be returned to their homes because of the lack of facilities and trained personnel to cope with the problems Nursing service personnel must be provided

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Surgery of the Extremities in Treatment of Cerebral Palsy

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Surgery of the extremities has a definite role in the comprehensive treatment program for the child with cerebral palsy It is reserved for those contractures that can be effectively released, those deformities which other measures have failed to bring to correction, and those conditions in which surgery is a prerequisite for subsequent treatment Such surgery is recommended for the truly spastic group In the athetoid group, on the other hand, surgery is limited to arthrodesis of joints in selected patients Analysis of 200 operations, performed on 95 selected patients during the period 1948 to 1958, showed that most gratifying results were obtained in improving muscle function and skill, in eliminating crutch support and bracing, and in facilitating or shortening the treatment program

CEREBRAL palsy has been regarded as one of the most frequent causes of crippling in children For many years, the care of the cerebral-palsied child has been entrusted to the orthopedic surgeon It is generally recognized that this child requires a comprehensive program for complete rehabilitation This program now encompasses the integrated services of a team of specialists, to insure the psychological, educational, and social restoration of the child, as well as his physical restoration

Surgery of the extremities has a definite role in the over-all treatment program During recent years, greater and greater emphasis has been placed upon treatment by physical therapy, exercises, and braces This increased stress on the conservative management of the cerebral-palsied child has strongly retarded the development of surgical treatment and has fostered the growth of many fallacies regarding the use of surgery in the rehabilitation program The general misunderstanding of the use of surgery may be attributed to a lack of understanding of the basic fundamentals of the underlying problem, to the improper selection of patients, and to the use of injudicious procedures

The status of surgery in the treatment program has become more clearly delineated in recent years The time-honored view, that operative indications are to be strictly limited to patients who are refractory to treatment by physical therapy, exercises, and braces, requires revision Surgical correction is only one element in the over-all program It must be considered proportionately, in each patient, only by what it may contribute to the over-all plan of treatment for the rehabilitation of the child The three general modalities of treatment—bracing, physical therapy, and surgery—should be assessed in terms of the effect each will exert on the over-all program The discriminating surgeon should reserve surgical treatment for those contractures that can be effectively released, those deformities which other measures have failed to bring correction, and those for whom surgery is a preliminary step in the preparation for subsequent treatment by other methods[1]

Cerebral palsy, basically, is a physical disability resulting from an intracranial lesion Such disability may encompass paralysis, weakness, incoordination, or functional deviation of the motor system In general, rehabilitation of the cerebral-palsied child requires the restoration of muscle balance, the realignment of weight-bearing joints, and the establishment of correct posture with normal relationship to the line of gravity[2] It is now generally agreed that surgery of the extremities is most successful in patients with cerebral spasticity This surgery must be predetermined by a complete and careful muscle analysis It is also true that purely postural contractures may be corrected only if the patient will be able to use that extremity in the corrected position Whenever possible, attempts should be made to evaluate beforehand the anticipated results of the surgery Braces and splints may

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be used to test the expected postural joint correction

Extremity surgery in the athetoid group not only may result in complete failure but may produce a worse deformity than the original one Since athetosis is an attempt by the patient to get the extremities into a distorted position, no matter what muscle or group of muscles is used to bring about this distortion, surgery, under these circumstances, would result in the uncontrollable use of other muscles to bring about the same deformity This is particularly true of the transposition of tendons in the extremities of athetoids Surgery of the athetoid extremity should not be attempted until the anticipated results of the surgery have been initiated by the application of splints or braces for a long enough period of time to permit evaluation of the proposed procedure against the desired result In the athetoid, surgery should be limited to arthrodesis of joints in selected patients rather than to tendon lengthening, neurectomy, or tendon transposition

In the cerebral-spastic extremity, the procedure of choice will depend on a careful muscle evaluation For, in such an extremity, one may detect not only truly spastic muscles but also normal muscles and flaccid or "zero-cerebral" muscles The mixed muscle picture in the involved extremity may be attributed to the nature of the cerebral pathology, that is, involvement of Brodmann s Areas 4 and 6 of the motor cortex[3] When Area 4 alone is involved, the corresponding motor component in the extremity is represented by a flaccid group of muscles Most often, one finds involvement of both cortical areas, resulting in a mixture of muscle tone in the same extremity The spastic group of the cerebral-palsied is characterized by the predominance of cerebral-spastic muscles in the extremities, that is, muscles exhibiting the phenomenon of the "stretch reflex'[4] The stretch reflex is the ability of a muscle to contract to its maximum as a result of being stretched That is, the contraction of the antagonist (for example, the hamstring muscles in flexion of the knee joint), will produce a stretching of the hypercontractile, "spastic' muscle (the quadriceps in this case), causing the quadriceps to contract and block the voluntary motion of knee flexion The quadriceps muscle is then said to be a "cerebral-spastic' muscle[5] The success of the proposed surgery will depend on the accuracy of the appraisal of the normal, cerebral-spastic, and zero-cerebral muscles in the extremity

TABLE 1 —Deformities Corrected

Equinus deformity of foot	91
Adduction contracture of hips	37
Knee flexion deformity	17
Flexion deformity at wrist	12
Hip flexion deformity	3
Pes valgoplanus	3
Severe tibial torsion	1
Subluxation of hip	1
Leg length discrepancy	1

The timing of the proposed surgery in the general schema of the comprehensive treatment program is also of extreme importance This timing requires judgment based on a careful appraisal of the individual problem at hand in the light of the over-all progress of the patient In general, surgical treatment may be delayed until the effects of physical therapy and bracing have been studied for a discrete interval Surgery may be delayed as long as the patient makes satisfactory progress with the other modalities of treatment Time may be allowed for evaluation of the patient's level of intelligence, and his potentiality for physical development In other situations, it may be necessary to relieve the patient of the disabling effects of spasticity before instituting a program of training for physical restoration Surgery should be proposed only if there are resources for a carefully planned postoperative physical-therapy-and-bracing program Early surgery may make later treatment by other modalities more effective Surgery, on the other hand, may become imperative as a result of an impasse in the patient's progress in the therapy-and-bracing program, the occurrence of further deformity as bony growth continues, or the acquisition of other complications in the course of the conservative treatment program

Material and Results

During the ten-year period 1948 to 1958, 200 operations were performed on 95 patients, either by me or by the resident surgeons under my supervision During this same period, 2,853 children were evaluated orthopedically and 15,509 physical-therapy sessions, 10,289 occupational-therapy sessions, and 10,241 speech-therapy sessions were rendered

It may be noted, in the selection of patients for surgery, that 75 were in the comprehensive treatment program for at least one year prior to surgery, whereas 20 patients were under treatment for less than one year Considerable attention was given to the mental status of the patients considered for surgery Seventy-seven, or 81 per cent, of the patients in the series were rated psychologically as 'normal or borderline," and 18, or 19 per cent, were classified as retarded but trainable"

Clinically, 82 patients were classified as 'spastic," 7 as 'rigidities," and 6 as athetoid" Of the deformities requiring correction by surgery, Table 1 demonstrates that ankle equinus, adduction contracture of the hip, knee flexion, and wrist flexion deformities were encountered with greatest frequency

At the time of surgery, the average age of the patients in each group ranged from 4 to 19 years, the youngest patient being two years of age and the oldest, nineteen The age of the patients at the time of operation varied considerably with the type of procedure performed

The average length of follow-up ranged from three to eight years The progress of most patients was followed postoperatively for over five years All patients in this series were examined and observed in the follow-up clinic by me

The criteria utilized to grade the final results were simple Did the surgery adequately correct the deformity? Was muscle function and skill improved? Was the course of the therapy program facilitated or shortened? Were braces and crutch support eliminated? Was the total effect of the surgery considered worthwhile by the patients and their parents?

The evaluation of the results of the surgery in this series is outlined in Table 2 The number of operations performed in relation to the greater amount of conservative therapy in no measure depreciates the importance of carefully planned surgery in the comprehensive treatment program Surgery was performed to correct deformity, to improve muscle function and skill, to restore muscle balance in the involved extremity, to assure proper alignment of the joints concerned with weight-bearing, and to establish correct posture The results of this surgery were most gratifying For the most part, muscle function and skill improved sharply, bracing-and-crutch support were frequently eliminated, and the course of the therapy program was facilitated and often shortened

On the other hand, the effectiveness of the surgery performed was strongly enhanced by a balanced physical-therapy-and-bracing program The importance of the need for the therapeutic team approach in the physical restoration of the cerebral-palsied child cannot be emphasized too strongly Physical therapy and bracing, like surgery, must be considered as a vital part of the over-all treatment program Surgery of the extremities in the cerebral-palsied child should be considered as a means to facilitate and supplement the effect of conservative treatment, rather than as action utilized in desperation, when conservative therapy has failed The results of the surgery performed in this clinic in the period 1948-1958, fortifies the conviction that certain well-selected surgical procedures, with adequate, intelligent, postoperative treatment, offer benefits to the handicapped child which other modalities of treatment cannot achieve of themselves

Summary

A comprehensive treatment program for the rehabilitation of the cerebral-palsied child now encompasses the integrated services of a team of specialists to insure the psychological, educational, and social restoration of the child, as well as his physical restoration Surgery of the extremities has a definite role in the over-all treatment program, and must be considered proportionately as it applies to the individual patient

Surgery should be reserved for those contractures that can be effectively released, those deformities which other measures have failed to correct, and those patients for whom surgery is a preliminary step in preparation for subsequent treatment Surgery of the extremities is successful in the true cerebral-spastic type of cerebral palsy Surgery in the athetoid type should be limited to arthrodesis of joints in selected patients The procedure of choice will depend on a careful muscle evaluation of the extremities involved The "timing" of the proposed surgery is important in the over-all treatment program In this clinic, 200 operations were performed on 95 patients during the period 1948-1958 The results were most gratifying in improving muscle function and skill, in eliminating bracing and crutch support, and in facilitating or shortening the therapy program

TABLE 2 —*Clinical Evaluation of Ninety five Patients*

Types of Operations	No	Average Age, Yr	Results			Average Follow up, Yrs
			Good	Fair	Poor	
Tenotomies—140						
Achilles (lengthening)	74	7 7	65	8	1	4 5
Adductor (and anterior obturator) neurectomy	54	7 1	50	1	3	4 0
Hamstrings	10	13 0	6	3	1	4 5
Plantar fascia	2	10 0	2			3 0
Tendon Transfer—32						
Hamstrings	11	10 3	9	2		4 2
Posterior tibial	9	9 2	6	3		5 2
Patella (advancement)	7	13 2	6	1		5 5
Wrist flexors	4	10 5	1	3		5 7
Anterior tibial	1	8 0		1		8 0
Muscle Origin Release—8						
Gastrocnemius	5	7 0	2	3		3 0
Hip flexors	3	11 5	3			7 0
Neurectomies—4						
(Anterior obturator—see adductor tenotomy)						
Popliteal	3	14 0		1	1	7 0
Median	1	19 0			1	8 0
Arthrodeses—14						
Wrist	7	13 7	7			4 8
Subastragalar	7	14 8	5	2		6 0
Osteotomy—1						
Tibia	1	4 0	1			7 3
Epiphysial Arrest—1						
Upper tibia and fibula	1	12 0	1			5 4
Total	200					

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Postsurgical Staphylococcic Infections

Outbreak Traced to an Individual Carrying Phage Strains 80/81 and 80/81/52/52A

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Epidemics of staphylococcic infection in operating rooms have stimulated a critical interest in the origin and mode of transmission The patience, ingenuity and thoroughness required for the solution of such problems are illustrated by the account of Surgeon C identified as the precipitating source of an epidemic He was involved in 15 thoracic operations in which staphylococcic complications developed Strains of staphylococci cultured from his face, nose and hands were found, by antibiograms and phage typing, to be the same as those obtained from lesions in the infected patients Pertinent questions are the reasons for Surgeon C's propensity for carrying epidemic strains and for his reversion, without treatment, to a negative carrier state After a carrier has been identified and transferred, strict adherence to aseptic techniques will reduce the morbidity and mortality

STAPHYLCOCCIC infections in surgical practice are by no means of recent origin In older days, as a matter of fact, "so common was suppuration following surgery that active measures were often used to hasten the formation of laudable pus"[1] In spite of the absence of antibiotics for therapy and the lack of such epidemiological tools as bacteriophage typing, a strict adherence to aseptic techniques was sufficient to reduce morbidity and mortality in those days[2]

The purpose of this report is not to dwell on the possible role played by antibiotics in the present problem with staphylococcic infections, rather, the emphasis will be placed on how the use of the "old methods" and the new tools of epidemiology can help trace the source and spread of these infections and serve as a basis for control measures Such an approach served to delineate the most likely source of staphylococcic infections occurring in 13 postoperative patients, to speculate on possible modes of spread, and to take proper steps in preventing continued occurrence

Towards the end of October, 1958, the impression was gained at this 300-bed hospital, where approximately 600 operations are performed each month, that the number of postoperative wound infections had increased inordinately A study was thus initiated by the Hospital Infection Committee to evaluate the extent of the problem and to take proper control measures

Epidemiological Studies

The first question to answer in any investigation of an outbreak of staphylococcic infections in a hospital is this Is the problem widespread among patients on all services in the hospital, or is it limited to patients treated on one particular service? Three sources were used to assist in defining this question A review of the bacteriology records (table 1) was made to ascertain the number of cultures positive for coagulase-positive staphylococci Although this is dependent on the number of lesions actually cultured, it revealed an increase in positive cultures from postoperative infections from a count of one to three from January to July to a count of six to seven from August to October of 1958, whereas the number appeared uniform for other than postoperative cultures Table 2 summarizes the response of 100 staff physicians at our hospital to a staphylococcus questionnaire Although the accuracy of the figures listed is open to much question, a compilation of these figures pointed again to the problem being mostly a surgi-

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From the Epidemic Intelligence Service Communicable Disease Center Public Health Service United States Department of Health Education and Welfare (Dr Nahmias) Director of Laboratories and Chairman Infections Committee St. Joseph s Infirmary (Dr Godwin) Chief Staphylococcus and Streptococcus Unit Laboratory Branch Communicable Disease Center (Dr Updyke) Chief of Thoracic Surgery St Joseph s Infirmary (Dr Hopkins) cal one Thirty-three wound infections were reported by the physicians, comprising the greatest number of serious infections noted at the hospital Apart from other interesting information which can be gathered from table 2, an important feature was that 25 of the 94 wound infections (over one-quarter) were seen in the physician's office This point must always be kept in mind if a true incidence of surgical or other hospital-associated staphylococcic infections is ever to be ascertained An attempt was made to review all the charts coded out as "staphylococcal infections" or as "postoperative complications" The poor information obtained from this records search points strongly to the need for physicians to record all infections on the patients' discharge charts and, ideally, to report infections in their patients even after discharge The pressing problem appeared to center on the surgical service Informal discussion with hospital personnel on various services supported this conclusion

Table 1—*Monthly Bacteriological Records of Staphylococcic Cultures*

1958	Postoperative	Other*
January	1	13
February	2	17
March	3	12
April	2	10
May	3	15
June	3	5
July	1	4
August	7	8
September	6	5
October	7	7

* Includes cultures obtained from outpatients and inpatients on other than surgical services

The next questions posed in narrowing the problem still further were 1 Is this surgical problem one acquired from cross-infection on the wards, one acquired in the operating room itself, or both? 2 Is it widespread among many surgical teams or among one in particular?

It was found that there had been 12 postoperative infections in one particular surgical team—in thoracic surgery—from July 17, 1958, to the time the intensive study was begun on Oct 25, 1958 All infections had occurred in patients who were operated on in one operating room Cross-infection in the ward was quickly eliminated since there was no surgical ward at the hospital The nature and time of appearance of lesions pointed to these being acquired in the operating room

The environmental factors related to the "suspect" operating room were also ruled out epidemiologically There was no evidence of disease occurring when different personnel used the same facilities If the air was to be incriminated as a means of spread, patients operated on before or after those who developed infections should also have developed infections This was not the case Similar reasoning was used to rule out laundry material If improper sterilization of instruments had a causative role, this would also have been reflected in other patients However, it was still possible for one item used in thoracic surgery alone to be implicated

As can be noted from table 3, operations performed on the 12 patients who became infected by Oct 25 (the 13th occurred later) varied between those performed on the lungs, the heart, and the gastrointestinal system, so that the heart-lung machine, for example, could not be implicated

Table 3 also shows the length of operations to be long, varying from one to seven hours, with an average duration of four hours Infections (as an average) were noted on the chart within 10 days postoperatively, although signs of infection (such as inflammation and fever) were often present earlier Although the majority were wound infections, there were several life-threatening infections, such as subacute bacterial endocarditis in a patient (7) who remained an additional five months in the hospital because of this complication Three out of 13 infections (23%) occurred after the patient had left the hospital Prophylactic antibiotic therapy, consisting most commonly of a penicillin-streptomycin combination, was used in all cases but one

Narrowing the Problem to a Human Source—In order to evaluate the possibility of a human source, a table, such as that used to trace down the source of a food poisoning outbreak, was made (table 4) On the vertical line the patients are listed, 1 to 12 All personnel involved in each of these 12 operations are listed horizontally—surgeons, nurses, anesthesiologists, and others It is apparent that only Surgeon C was involved in all of the 12 operative procedures There was no evidence that any of the other members of the team who participated

Table 2—*Response by One Hundred Staff Physicians to Staphylococcus Questionnaires*

Type of Case	Total	Patients Treated in this Hospital No	Patients Treated in other Hospitals No	Patients Treated in Physician s Office, No
Skin lesions	413	15	35	363
Pneumonia	17	1	16	0
Wound infections	94	33	36	25
Septicemia	11		7	1
Other*	12	2	1	9
	547	51	95	398

Physicians answers to questions regarding usual procedure

Question	Answer: Yes	No	Some
Is culture obtained in all cases of suspected infections?	47	38	15

Question	Answer	
Are antibiotics used for prophylaxis	In none of their cases	39
	In 25% of their cases	26
	In 50% of their cases	13
	In 75% of their cases	7
	In 100% of their cases	15

* The category designated as other includes such cases as osteomyelitis, breast abscess, septic arthritis, and brain abscess

in many operations in this or other hospitals were associated with any infections in patients

Additional information on Surgeon C is presented in the figure Surgeon C had changed services from General Surgery to Thoracic Surgery in July, 1958 There had been only one postoperative staphylococcic infection on the Thoracic Service three months prior to his coming on the service However, he was found to have been associated with at least four postoperative infections while on General Surgery as far back as November, 1957 Only two of these patients had had cultures taken, but these were found to be of the same antibiogram as cultures from the thoracic patients in this outbreak None of eight thoracic cases in which Surgeon C did not participate became infected None of 75 minor procedures done during the period from July to early November became infected as contrasted to 13 of the 45 major procedures (a case rate of 30%) which developed infections An intern who joined the thoracic team in October developed a leg abscess during the last week of that month

TABLE 3 —*Data on Thirteen Patients Who Developed Staphylococcic Infections Following Thoracic Surgery*

Patient	Type Operation	Length of Operation Hr *	Date of Operation	Date Infection Noted†	Type of Infection	Prophylactic Rx	Infection Noted in Hospital
1	Lobectomy	3¼	7/11	7/17	Wound	Yes	Yes
2	Pneumonectomy	4	7/30	8/ 6	Wound	Yes	Yes
3	Esophagocologastrostomy	5¼	8/ 1	8/10	Wound	Yes	Yes
4	Open Heart	6¼	8/12	8/29	Wound	Yes	Yes
5	Thoracotomy	2½	8/18	8/26	Wound	Yes	Yes
6	Lobectomy	3½	9/ 5	9/20	Wound	Yes	No
7	Mitral Valvulotomy	2½	9/ 9	9/16	Empyema and S B E ‡	Yes	Yes
8	Open Heart	5	9/16	10/ 7	Wound	Yes	Yes
9	Open Heart	3½	9/23	10/ 2	Wound	Yes	Yes
10	Pleural Biopsy	1	10/10	10/17	Subcutaneous Abscess	No	No
11	Lobectomy	4	10/13	10/22	Empyema	Yes	Yes
12	Esophagocologastrostomy	7	10/14	10/22	Subcutaneous Abscess	Yes	Yes
13	Thoracotomy	2	11/10	11/20	Recurr furunculosis	Yes	No

* Average length of operation 4 hr
† Average interval between operation and appearance of staphylococcic infections 10 days
‡ S B E subacute bacterial endocarditis

TABLE 4 —*Participation of Members of Thoracic Surgical Team in 12 Operations Followed by Infection*

Patient	Surgeons				Interns			Nurses				Anesthesiologists			Cardiologist and Technicians		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	X		X			X			X	X		X	X				
2	X		X			X		X			X	X		X			
3	X		X						X		X	X	X				
4		X	X		X				X	X	X		X	X	X	X	X
5		X	X		X			X		X			X				
6	X		X		X				X		X	X		X			
7	X		X		X			X		X			X		X	X	X
8			X	X					X	X	X		X		X	X	X
9	X		X	X				X		X	X	X		X	X	X	X
10		X	X		X			X		X			X		X		
11	X		X	X		X			X	X			X				
12	X		X				X		X			X		X			

X implies participation of member

Laboratory Studies

After the epidemiological finger pointed to Surgeon C, it was deemed important to have laboratory confirmation Table 5 summarizes the cultural studies done from the lesions of the patients and the intern, from the anterior nares of the personnel of the thoracic team on two occasions (Nov 3 and Nov 11), and from "settle" plates exposed to the air Unfortunately, no cultures had been saved for phage typing on five patients However, the antibiogram (as determined by the disc method against penicillin, erythromycin, chloramphenicol, aureomycin, and novobiocin) was similar in 10 of the 11 cultures, i e, resistant to penicillin, erythromycin, and aureomycin The five cultures that were phage typed were all 80/81 In addition, a culture taken from a lesion of an intern revealed an 80/81/52/52A strain

On Nov 3, all members of the surgical thoracic team and the patient being operated on had nasal cultures taken Of 16 persons from whom cultures were taken, six had coagulase-positive staphylococci and only one (Surgeon C) had an 80/81/52/52A strain

At this point, a question arose as to whether the strains of the 80/81 phage type from the patients were the same as those of phage type 80/81/52/52A from Surgeon C According to the rule of Anderson and Williams[3] that 'two strains are regarded as different only if one is lysed strongly by two phages that fail altogether to lyse the second,' these two strains should be considered as distinct Epidemiological data had pointed very strongly toward Surgeon C as being the most likely source of this outbreak, but this was not borne out by the laboratory data if the two phage types were truly different strains Fortunately, this was solved readily when several colonies from the same plate of Surgeon C's nose culture were selected separately and phage typed It was found that there were colonies of both the 80/81 and 80/81/52/52A strains on that same plate

Both types were also recovered when several colonies were chosen from plates of cultures obtained from the nose, face, and hands of Surgeon C

Each of these three sites was found to harbor both the 80/81 and the 80/81/52/52A strains

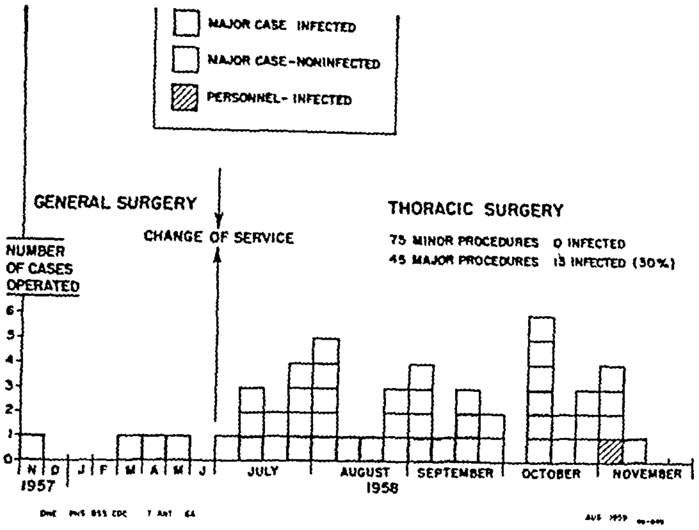

Fig 1—Epidemiological relationship of Surgeon C to operations

On Nov 11, repeat cultures obtained from 19 members of the surgical team and the patient operated on at this time revealed 5 (surgical team members) with coagulase-positive staphylococci but none with either the 80/81 or 80/81/52/52A types, again, these two types were recovered from the nose, face, and hands of Surgeon C On Nov 3, 1958, the 80/81 type was cultured from petri plates exposed to the air during an operation where Surgeon C was the only carrier On Nov 11, 1958, when Surgeon C was not present in the operating room, no organisms of the 80/81 phage type were recovered from exposure plates However, no attempts at quantitative air counts were made

TABLE 5—*Data from Bacteriological Studies*

Source	Date	Number of Cultures Taken	Number of Cultures With Coagulase positive Staphylococci	Number of Cultures With Organism Resistant			Number of Cultures According to Organism's Phage Pattern			
				PEA*	P* Only	Other	80/81	80/81/52/52A	Other†	Not Done
Lesions (Patients)	July to Oct 1958	11	11	10	1		5	0	0	6
Lesions (Intern)	11/5/58	1	1			1		1		
Nose O R‡ team and patient	11/3/58	16	6	1 (Surgeon C)	3	2	1 (Surgeon C) (Also from face and hands)	1 (Surgeon C)	5	
Nose, O R‡ team and patient	11/11/58	20	6	1 (Surgeon C)	3	2	1 (Surgeon C)	1 (Surgeon C)	5	
O R‡ air (Settle plate) Surgeon C present	11/3/58		5				3		2	
O R‡ air (Surgeon C absent)	11/11/58		4						4	

* P, penicillin, E, erythromycin, A, Aureomycin, Other, with different antibiogram pattern
† Other, with different phage pattern
‡ O R, operating room

Management of Carrier

The epidemiological and laboratory studies favored Surgeon C as the source of this outbreak The question of management came up for consideration.

On a Monday morning at 11 00 a m, a decision was reached In the meantime, earlier in the morning, Surgeon C had operated on the 13th patient (table 3) who later developed staphylococcic lesions of the 80/81 type

In three of the five previous outbreaks related to carriers reported in the world literature (table 6),[4] the carriers were advised of their potential danger to others Adherence to strict aseptic technique apparently resolved the problem In the two other outbreaks, the carriers were removed from the operating room It was decided to remove Surgeon C from all contact with patients

Surgeon C was also given a thorough physical examination (including ear, nose, and throat) which was within normal limits Repeated cultures taken from various sites of his body revealed the startling finding that no coagulase-positive staphylococci could be recovered within three days of his removal from patient contact

The previous cultures on Nov 3 and Nov 11 gave abundant growth of coagulase-positive staphylococci With similar techniques being used, repeat cultures on Nov 14, 15, 18, 21, 22, and 29 revealed that very few colonies which consisted mostly of coagulase-negative staphylococci could be recovered Surgeon C denied receiving any antibiotic or other form of therapy since his removal on Nov 11

Surgeon C left for a three-week vacation in December, and it was decided to treat him with a course of bacitracin-neomycin ointment (nasal) and orally administered chloramphenicol (2 Gm/day) for a period of one week After his return in December, cultures obtained from his nose and other sites (weekly and then biweekly) revealed only coagulase-negative staphylococci, except for one occasion in April when he was found to carry a penicillin-sensitive strain (phage type 29) On May 7 and May 27, he was again carrying only coagulase-negative staphylococci

Results of Control Efforts

With the removal of Surgeon C from the thoracic team in mid-November, all infections in patients operated upon by that team stopped. Similarly, there have been no infections since Surgeon C rejoined the team (after repeated carrier studies proved negative) in early January, 1959.

Another encouraging fact was that, following a control program as outlined elsewhere,[5] there were no staphylococcic infections on the surgical service for two whole months. Although there have been some infections since that time, the monthly infection rate—within the limits of our reporting system—has varied between 0.1 to 1.5% of all operations. If one compares these rates with those recorded elsewhere in the United States and in England which range from 2 to 10%,[6] it is felt that control of these infections in surgery is possible.

Discussion

Outbreaks of staphylococcic infections have been classified into three types.[3] In the first type of outbreak only one or two carriers of the "epidemic type" can be found and shown to be responsible for the spread of infection. In the second type of outbreak, the "epidemic type" is more widespread among personnel and throughout the environment. In the third type of outbreak, there is no one "epidemic type" of staphylococcus involved and, presumably, no common source of infection since these epidemics are believed to result from a general lowering of the standard of aseptic techniques. All these types have been found on surgical services as is evidenced by a summary of 15 such outbreaks from published records by Williams.[7]

The outbreak reported here is believed to be of the first type. A summary of five other surgical outbreaks related to asymptomatic carriers is presented in table 6 and includes the data from this present study for comparative purposes. This is the second reported outbreak from the United States of surgical infections related to an asymptomatic carrier and the first report to incriminate the 80/81 phage type. Browne and others[8] recently reported an outbreak of type 81 postsurgical infections in Canada related to a surgeon, an asymptomatic 81 carrier, which was controlled with a special mask.

Reports of infections following thoracic surgery have been sporadic[9] or in epidemic proportions.[10] Where the source has been sought in the two larger outbreaks, both human and environmental factors[10] have been incriminated.[11] In this present study there was no evidence that the environment served as a source or reservoir of staphylococcic infections. Indeed, in the careful analysis of the sporadic cases of staphylococcic infections which have occurred throughout the hospital since November, 1958, there has been very little evidence to support the possible role of the environment in the spread of these infections.

We can only speculate about the possible routes of spread from carrier to patient from the limited data available. In the one instance, on Nov 3, when a thorough study was made with cultures taken from the patient, the personnel, fomites, and the air of the operating room, the patient did not develop an infection even though the epidemic strain was found in the nose and skin of the carrier and on air "settle" plates. Since the patient was on penicillin-streptomycin therapy for prophylaxis,[7] a regimen which did not prevent infection in 12 patients in this series (table 3), and since the operating time was also long (three hours), one must hypothesize, for lack of a better explanation, that the host's natural resistance played an important role. This may have been the critical factor in some of the 32 patients exposed to Surgeon C who did not develop infections (see fig). It is also reasonable to hypothesize that there may be quantitative differences in numbers of staphylococci entering the wound (such an increase possibly occurring during a viral respiratory infection in the carrier). However, the "epidemic" curve does not reveal clustering of cases in any one week, and the carrier did not recall any respiratory infection. There is little doubt, however, that the length of exposure played a part in the acquisition of infection, only the major cases where the surgical procedure lasted usually well over one hour resulted in subsequent infection, while none of the minor cases did. It is difficult even to evaluate the droplet route of infection versus the direct contact route, since the "epi-

TABLE 6—*Summary of Six Outbreaks of Postsurgical Staphylococcic Infections Related to Asymptomatic Carrier**

Author	Country	Date of Report	Carrier	Type of Surgery	Number of Cases	Phage Type or Serological Type	Disposition of Carrier
Devenish and Miles (4a)	England	1939	Surgeon	General	20	Carrier III a Patients (not typed)	Strict asepsis†
Landy et al (4b)	U S A	1954	Surgeon	General	7	Same Antibiogram No phage typing done	Strict asepsis
Sompolinsky et al (4c)	Israel	1957	1 or 2 Nurses	Thoracic	14	6/47/53/75/77	Strict asepsis
Penikett et al (4d)	England	1958	Nurse	General	6	52A/79w	Removal from O R
Lautermann and Grun (4e)	Germany	1958	Surgeon	Plastic	[illegible]	[illegible]	Removal from O R †
Present Report	U S A	1959	Surgeon	Thoracic	13	80/81 and 80/81/52/52A	Removal from Patient Care

*Includes present outbreak of staphylococcic infections

†Personal communication

demic" strains were found in the nose, skin, and other parts of the body of the carrier. The possibility that the patients may have been auto-infected has been suggested [11], however, this source of infection in this outbreak, although impossible to rule out completely, does not appear too likely. It is also difficult to assess from this study the role of actual operative technique as a contributory factor in infection.

Several important aspects of the staphylococcic problem became apparent during this investigation. The importance of having an Infections Committee on guard at all times is emphasized. This can only be done by means of an effective surveillance system and an education program as described elsewhere [5] which is dependent on the cooperation of every physician and nurse on the staff. There is evident need to have cultures taken from all lesions and the staphylococcic isolates stored for at least six months for later phage-typing, if indicated. It is necessary to do epidemiological studies where associations in time and space can be determined, with the use of the laboratory as an adjunct. Such an approach will delineate the existence and extent of the problem (as it was done here) and will narrow down the use of laboratory procedures.

Appendix to Table 3

Patient	Type Operation	Length of Operation, Hrs	Date of Operation	Date Infection Noted	Type of Infection	Prophylactic Rx	Infection Noted in Hospital
14	Open heart	7	6/16/59	6/23/59	Empyema Septicemia	Yes	Yes
15	Thoracotomy	3	6/22/59	6/27/59	Wound	Yes	Yes

The management of asymptomatic carriers is still not resolved. A note of caution is warranted since all carriers of coagulase-positive staphylococci are by no means dangerous to others, nor are all carriers of the 80/81 phage type necessarily dangerous. In most cases, only a thorough study on time and space associations to infections in others will enable one to determine the potential danger of this individual to other people—patients, personnel, or family. It must also be remembered that a carrier of the 80/81 phage type in an outbreak may be a victim rather than the source of the epidemic. Thus, the exact time at which Surgeon C became a victim (i. e., first became a carrier most likely through exposure to patients with 80/81 lesions) and the time when he became a source can only be hypothesized from figure 2. It is conceivable that he became a victim in November, 1957, and a source shortly thereafter. If one follows this assumption through, his association with only four infections between November, 1957, and July, 1958, may merely reflect lack of data resulting from inadequate surveillance of infections prior to November, 1958. Another possibility is that of the greater exposure and susceptibility of thoracic patients who go through longer and more complicated operations, as contrasted to the exposure and susceptibility of general surgical patients.

The hardest point to understand (if one were to accept the above hypothesis) is the fact that Surgeon C reverted so rapidly to a negative carrier state (within three days after removal from patient care) with no therapy given to or admitted by him. Indeed, it would be a notable contribution if we knew what therapy could have eradicated so rapidly and completely his carrier state!

We believe, with our present knowledge, that having him use antibiotics while he was on vacation in December, 1958, was not necessary. A "spontaneous" reversal to a negative status should have been satisfactory.

Regarding Surgeon C, the findings of the two phage strains 80/81 and 80/81/52/52A from the same sites led to much speculation as to the significance of the latter strain. However, further work in the Atlanta area has revealed that the 80/81/52/52A and another type, the 80/52/52A, have been found not only in sporadic cases but in epidemic proportions.[12]

Recent separate reports from Australia [13] and England [14] demonstrated that the 80/81 strain can be converted in vitro to either the 80/52/52A or the 80/81/52/52A strains. At the Communicable Disease Center Laboratory in Chamblee, Georgia, Dr N. Sakurai, working independently of the Australian and English laboratories, has also induced this in vitro conversion. In addition, he has been able to convert 80/81/52/52A strains to phage type 80/81. The epidemiological implications of these findings have been presented elsewhere.[15]

Summary

An outbreak of 13 surgical postoperative infections occurring in thoracic surgery was traced epidemiologically to an asymptomatic carrier who was a surgeon. Six of these infections, where cultures were available for phage-typing, were found to be of the 80/81 phage type, and all but one of the 13 cultures obtained had the same antibiogram—resistant to penicillin, aureomycin, and erythromycin. The surgeon was found to carry in his nose and on his face and hands both the 80/81 and the 80/81/52/52A strains of staphylococci with antibiograms similar to those cultured from the lesions of the patients. Removal of the surgeon carrier from patient contact stopped the infections. When the surgeon was no longer a carrier, he rejoined the original operating team There have been no further infections for a period of seven months

Addendum

Two more postoperative staphylococcic infections have occurred following operations by the thoracic surgical team since this report was presented on June 9, 1959, at the American Medical Association Meeting Immediate steps were taken to discover the possible source These data complete table 3 of the earlier report

On June 28, 1959, all personnel who participated in either or both of these operations had cultures taken from their anterior nares In addition, Surgeon C had cultures taken from the throat and hands Findings of the cultures are given

Of the 22 cultures taken from personnel, 11 had coagulase-positive staphylococci Of these 11, however, there were no carriers of the 80/81 strain which was the type recovered from both patients, but three (Surgeon C, Intern E and Technician P) carried the 80/52/52A strains Of those three, only Surgeon C had contact with both patients (numbers 14 and 15) and only his cultures had antibiograms similar to those of the patients cultures—resistant to penicillin, erythromycin, and chlortetracycline (Aureomycin) hydrochloride The problem of the difference in phage types between the cultures of the patients (80/81) and that of Surgeon C (80/52/52A) was very similar to the dilemma which faced us earlier when the 80/81/52/52A phage type was recovered from Surgeon C

Appendix to Table 5

Source of Culture	Site of Culture	Antibiogram*	Phage Type	Contact With Pt 14	Contact With Pt 15
Patient 14	Empyema & blood	PEA	80/81		
Patient 15	Wound	PEA	80/81		
Surgeon C	Nose & throat	PFA	80/52/52A	Yes	Yes
Intern E	Nose	PA	80/52/52A	Yes	No
Technician P	Nose	PA	80/52/52A	No	Yes

P penicillin E erythromycin A Aureomycin

However, this time, despite the fact that 25 colonies were chosen individually from plates made of the cultures from the nose and throat of Surgeon C, all were phage typed as 80/52/52A Surgeon C left the United States on June 30, and additional cultures could not be obtained After his departure, for over six months there were no further infections despite the fact that Intern E and Technician P were still active on the thoracic team

It appears most likely that Surgeon C was again the source of these two infections There are many unanswered questions regarding him, such as the reason for his propensity to become a carrier of 'epidemic strains The fact that he has been carrying the three strains 80/81, 80/81/52/52A, and 80/52/52A at one time or other but was associated only with patients with lesions phage-typed as 80/81 illustrates the complexity of evaluating conflicting evidence from the laboratory and from epidemiological observation

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Early Use of Oxygen in Coronary Thrombosis

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The sooner oxygen is employed for relief of myocardial hypoxia in acute coronary thrombosis, the greater is its lifesaving potential, a view supported by recent studies. In two patients, convalescent from coronary thrombosis, the arterial pO_2 was more than doubled upon inhalation of 40% oxygen with a pocket dispenser. Electrocardiographic abnormalities induced by the Master 2-step exercise test while breathing air were inhibited, partly or totally, in 11 of 12 patients when the exercise was performed breathing oxygen. Recently-developed portable equipment for effective oxygen therapy includes refillable 75- and 150-liter cylinders with 2-stage regulators, as well as smaller devices with disposable, miniature oxygen cartridges. This apparatus, which can be carried by doctor and patient, has now made feasible an earlier and more widespread therapeutic use of oxygen.

THE PURPOSE of this paper is to support the thesis that an earlier use of oxygen in the treatment of coronary thrombosis than that which is currently employed is now indicated and feasible. The physiological studies to be presented add confirming evidence concerning the crucial role played by hypoxia in coronary insufficiency and the protective value of oxygen inhalation.

Review

Since Keefer and Resnik[1] made the pioneering suggestion that oxygen-want was the critical cause of anginal pain, the therapeutic use of oxygen has been reported as a valuable, and, at times, lifesaving procedure in the treatment of coronary thrombosis in cases of cardiac insufficiency and shock and in cases of severe anginal pain.[2] The inhalation of low-oxygen mixtures has been studied as a method of inducing the clinical and electrocardiographic signs of coronary insufficiency both from the standpoint of a test of the presence or absence of coronary disease and the documentation of the physiological relation between ischemic hypoxia and cardiac pain.[3] The clinical and physiological findings concerned with the relation between ischemic hypoxia and coronary insufficiency have been recently reviewed,[4] including the interesting observation that alkalosis plays an important role in the production of anginal pain induced by inhalation of a 10 per cent oxygen mixture. When 2 to 3 per cent carbon dioxide was inhaled with the low-oxygen atmosphere, the occurrence of anginal pain and electrocardiographic abnormalities were prevented.

It has also been shown that hyperventilation in normal subjects produced electrocardiographic alterations characteristic of coronary insufficiency, but that hyperventilation with 6 per cent carbon dioxide was not followed by these electrocardiographic changes.[5] Thus, when anxiety actually does initiate over-breathing, it may play a significant role in the production of angina pectoris, by reason of the consequences of respiratory alkalosis, including that of tissue hypoxia.

The increased exercise tolerance of patients with angina pectoris during oxygen inhalation is also consistent with the thesis that anoxemia is a critical factor in the symptomatology of coronary insufficiency;[6] exercise breathing oxygen instead of air results in a smaller rise of lactic acid.[7] The results reported in this paper reveal the value of oxygen inhalation in exercising patients who have coronary disease.

The current clinical recommendation for the treatment of patients with coronary thrombosis is to have them live in an atmosphere which is high in oxygen during the first few days they may suffer a coronary occlusion. "The relief from pain often is extraordinary and often the heart rate is slowed,

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too Since they (the coronary arteries) are designed to bring oxygen to the tissues, the basic damage from coronary thrombosis is that a part of the heart is deprived of oxygen" [8]

Cardiac insufficiency, associated with coronary thrombosis as well as other clinical entities, is frequently benefited by oxygen therapy Thus, relief of dyspnea and lowering of the ventilation in patients with pulmonary emphysema has been recognized as a specific consequence of oxygen treatment, oxygen inhalation increases the arterial oxygen saturation in cases of cardiac failure and induces a diuresis in part due to improved myocardial function and in part the result of the chemical consequences initiated by administration of oxygen, i e, increased output of chlorides secondary to carbon dioxide retention [9] Appropriately regulated oxygen treatment of chronic pulmonary disease was frequently found to be effective in the restoration of cardiorespiratory compensation without adverse side effects [10], recently, the use of oxygen during exercise has been made the basis of a program of training for cases of cardiopulmonary insufficiency by which an increased capacity for physical exertion or exercise developed gradually after a regimen of walking during the inhalation of oxygen [10-14]

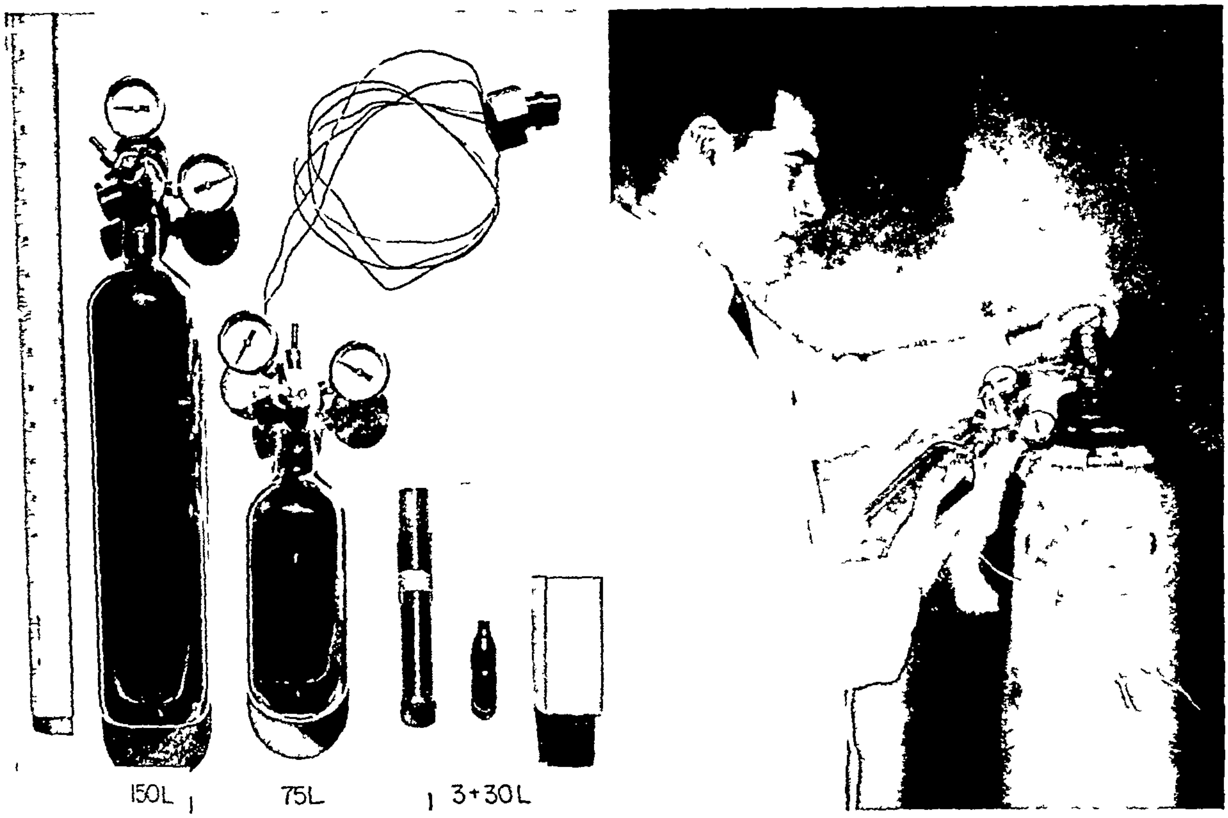


Fig 1—The 150- and 75-liter cylinders are equipped with aluminum two-stage regulator, 75-liter cylinder is shown being refilled from a 244 cu ft cylinder When valve on large cylinder is closed after refill, the adapter on the small cylinder is unscrewed and automatically seals itself Pocket oxygen device is shown with box of 10 refills containing 3 liters each, which would furnish a total of 33 liters of 100 per cent oxygen and with use of venturimeter at No 3 position, would supply 231 liters of 32 per cent ogygen

In many patients with pulmonary emphysema and certain patients with heart disease, inhalation of 40 to 50 per cent oxygen permitted exercise for longer periods of time and with less distress than when air was breathed [12], furthermore, the portable oxygen dispenser to be described later was shown to be of considerable therapeutic value in the relief of the symptoms due to hypoxia in cardiopulmonary illness [12, 13]

This review of the factor of hypoxia in coronary and cardiac insufficiency is by no means complete, the physiological basis of the clinical response to the correction of hypoxia has also been made manifest in terms of cardiac hemodynamics Thus, it has been reported that the pulmonary arterial pressure is promptly lowered by oxygen inhalation in cases of pulmonary hypertension due to septal defect, in these cases of septal defect, administration of oxygen resulted in an increase in pulmonary blood flow in cases both of pulmonary hypertension and without pulmonary hypertension [14] In coronary patients subjected to exercise who had angina and depressed S-T segments, myocardial ischemia was evidenced by a fall in venous oxygen saturation and the appearance of both lactate and pyruvate in coronary venous blood [15] Beck [16] and his collaborators, pioneers in cardiac resuscitation in deaths due to coronary disease, emphasize the primary importance of providing oxygen by inhalation, since coronary disease kills either by electrical instability or damage to the cardiac muscle, both of which they state are related to the oxygen content of the muscle. In the absence of pressure oxygen apparatus, mouth-to-mouth insufflation could be carried out by the operator inhaling oxygen, the various portable devices to be described lend themselves to widespread use of this method of combining oxygen therapy with mouth-to-mouth insufflation.

Methods and Results

Although previously-reported effects of administration of oxygen-enriched atmospheres are relevant to the application of recently-developed portable apparatus suitable for use by the doctor or the patient, it was of interest to examine the effectiveness of a small oxygen dispenser by which various oxygen concentrations may be given through a venturimeter[4] (Fig 1). If the patient selects a 32 per cent oxygen concentration in operating the dispenser device (Oxy-Hale) shown, 3 liters of oxygen are mixed with 18 liters of air, the total oxygen air volume available for inspiration being 21 liters; at a 40 per cent setting, the total oxygen air volume is 12 liters.

The development of an apparatus which can be used by the physician as well as by the patient includes high pressure oxygen cylinders containing 75 to 155 liters of oxygen, weighing 2 to 4 lb (0.9 to 1.8 kg), with two-stage 1-lb (0.5 kg) aluminum regulator which provides an unvarying liter flow of oxygen.

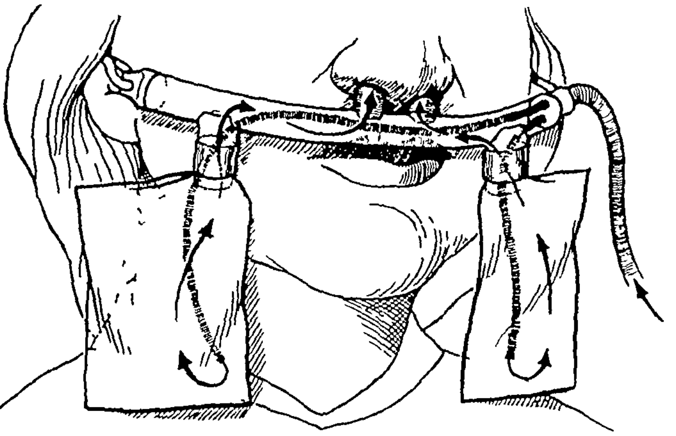


Fig 2.—Nasal cannula is shown with two collecting bags for oxygen. Oxygen flow is introduced into the bottom of each plastic bag, which adds oxygen during inspiration and expiration, the overflow passing to outside air around nostril tips.

The inspired oxygen percentage of the oxygen-enriched atmosphere administered depends on the volume of oxygen actually inhaled, the minute volume of respiration of the individual patient and the inspiratory minute volume and flow rate. A continuous oxygen flow of 3 liters per minute into a mask or nasal apparatus with a collecting bag could provide 3 liters of oxygen for inspiration. A similar result would require a flow rate of 6 liters per minute if the oxygen flow was limited to inspiration only; in each case, the higher the pulmonary ventilation, the lower the inspired oxygen percentage.

Regulation of the flow rate of the apparatus employed for continuous use, at home or out-of-doors, is required for effective oxygen therapy. In a device which employs low pressure oxygen cylinders and fixed orifice, the oxygen delivered may fall below 1 or 2 liters per minute. In addition, if the device is operated during inspiration only, the inspired oxygen percentage must be calculated on the basis of one-half the oxygen flow rate per minute. The problems which confront the patient with hypoxic cardiorespiratory disease are serious indeed, and the physician should be informed of the performance of the apparatus used. (A table is available which indicates the inspired oxygen concentrations at various pulmonary ventilations and at various oxygen flow rates; the pertinent literature may also be obtained from one of us [A. L. B.].) Thus, when the pulmonary ventilation increases from 8 to 10, 12 and 16 liters per minute, the inspired oxygen falls from 51 to 45, 41 and 36 per cent respectively.[1]

The nasal cannula is comfortable at low flows but is wasteful of oxygen and inadequate for administration of high concentrations of oxygen. With the employment of a 300-cc reservoir by two plastic bags attached to the cannula (Fig 2), the concentration of oxygen at a three-liter flow is substantially increased by storage of oxygen delivered during expiration, approximating that previously discussed. With a flow of 5 liters per minute, the oxygen concentration may range from 46 to 60 per cent, with minute volumes of breathing between 16 and 10 liters per minute, and without significant increase in the carbon dioxide percentage of the inspired air. The concentration of oxygen can be calculated by the data given in the Table; thus, a flow of 3 liters per minute delivered with a two-stage regulator provides 45 to 36 per cent oxygen with ventilations of 10 to 16 liters per minute provided all the oxygen stored in a collecting bag during inspiration and expiration is breathed during the inspiratory cycle.

In two patients with convalescent coronary thrombosis, the dispenser was used at a setting of

Oxygen Concentration in Inspired Air at Varying Pulmonary Ventilations of Patients When Total Volume of Oxygen Administered is Inspired

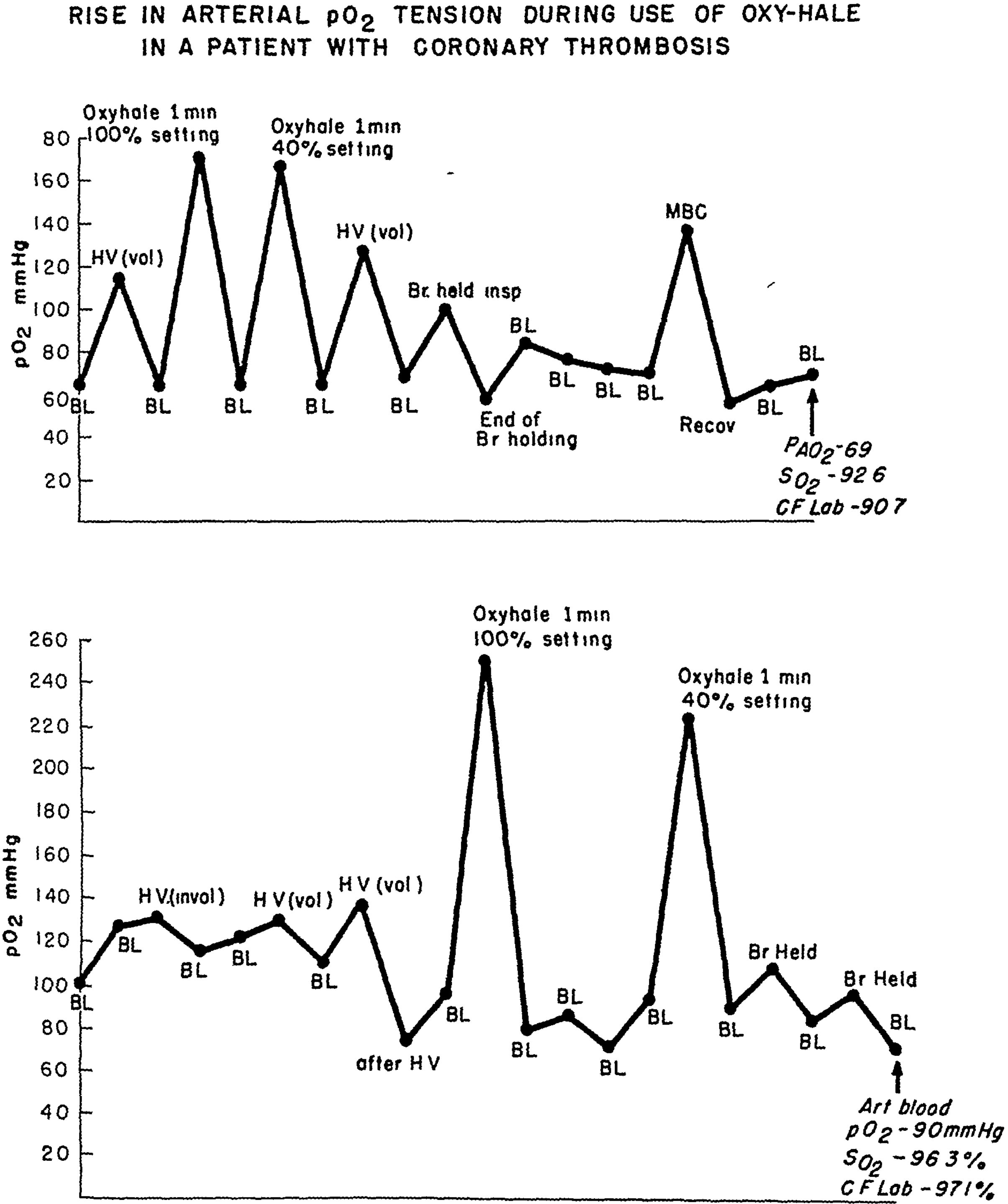
Oxygen Delivered into Mask or Nasal Apparatus with Collecting Bag, Liters/Min	Oxygen Delivered into Mouthpiece During Inspiration Only, Liters/Min	Basal Ventilation at Rest Liters/Min		Ambulatory or Dyspneic Liters/Min †			
		6*	8	10	12	16	20
2.0	4.0	47	41	37	34	31	28
2.5	5.0	54	45	41	37	33	31
3.0	6.1	61	51	45	41	36	33
5.0	10.0	83	70	60	55	46	41

* Do not apply to the dyspneic cardiac or respiratory patient unless relatively basal conditions are present.

† More applicable to ambulatory case of hypoxia; some severe cases manifest higher inspiratory minute volumes and flow rates.

40 per cent, these individuals were at rest and their ventilation was assumed to be not more than 12 liters per minute Since this apparatus is practical for clinical use at concentrations between 32 and 50 per cent, emphasis will be placed on the results revealed in Figure 3, at a 40 per cent setting

Although a moderate rise in arterial oxygen pressure was obtained by hyperventilation, the tissue


RISE IN ARTERIAL pO_2 TENSION DURING USE OF OXY-HALE IN A PATIENT WITH CORONARY THROMBOSIS

Courtesy of Robin W Briehl, M D , Cardio-Respiratory Laboratory,
Columbia-Presbyterian Medical Center , Alfred P Fishman, M D , Director

Fig 3 —Data on two cases of convalescent coronary thrombosis by administration of 40 per cent oxygen with the dispenser apparatus In first case, *top*, arterial pO_2 rose from 56 to 125 mm Hg on hyperventilation and to 170 mm Hg on oxygen In the second, *bottom*, arterial pO_2 rose from 100 mm Hg to 135 on hyperventilation and to 230 mm Hg on oxygen

oxygen tension was not correspondingly elevated owing to the Bohr effect of alkalinity on the release of oxygen to the cell Hyperventilation alkalosis of itself may induce tissue hypoxia as well as the adverse effects noted in patients with coronary disease It will be seen in the upper figure that this patient's lowered arterial pO_2, 65 mm Hg, before treatment, was elevated to 170 mm Hg after breathing 40 per cent oxygen for one minute In the lower graph, the results of a patient with a normal oxygen saturation show that the arterial pO_2 was raised from 100 to 230 mm Hg, after breathing oxygen at the 40 per cent setting for one minute

In a study of 22 patients with coronary insufficiency, 17 showed electrocardiographic changes when breathing 100 per cent oxygen at rest, either in the T-wave, or S-T segment, or both Twelve of these patients were able to perform the Master two-step test while breathing air In 11 of the 12, exercise induced abnormalities in the electrocardiogram which were not present in a subsequent similar test conducted during inhalation of oxygen An illustrative response is shown in Figure 4

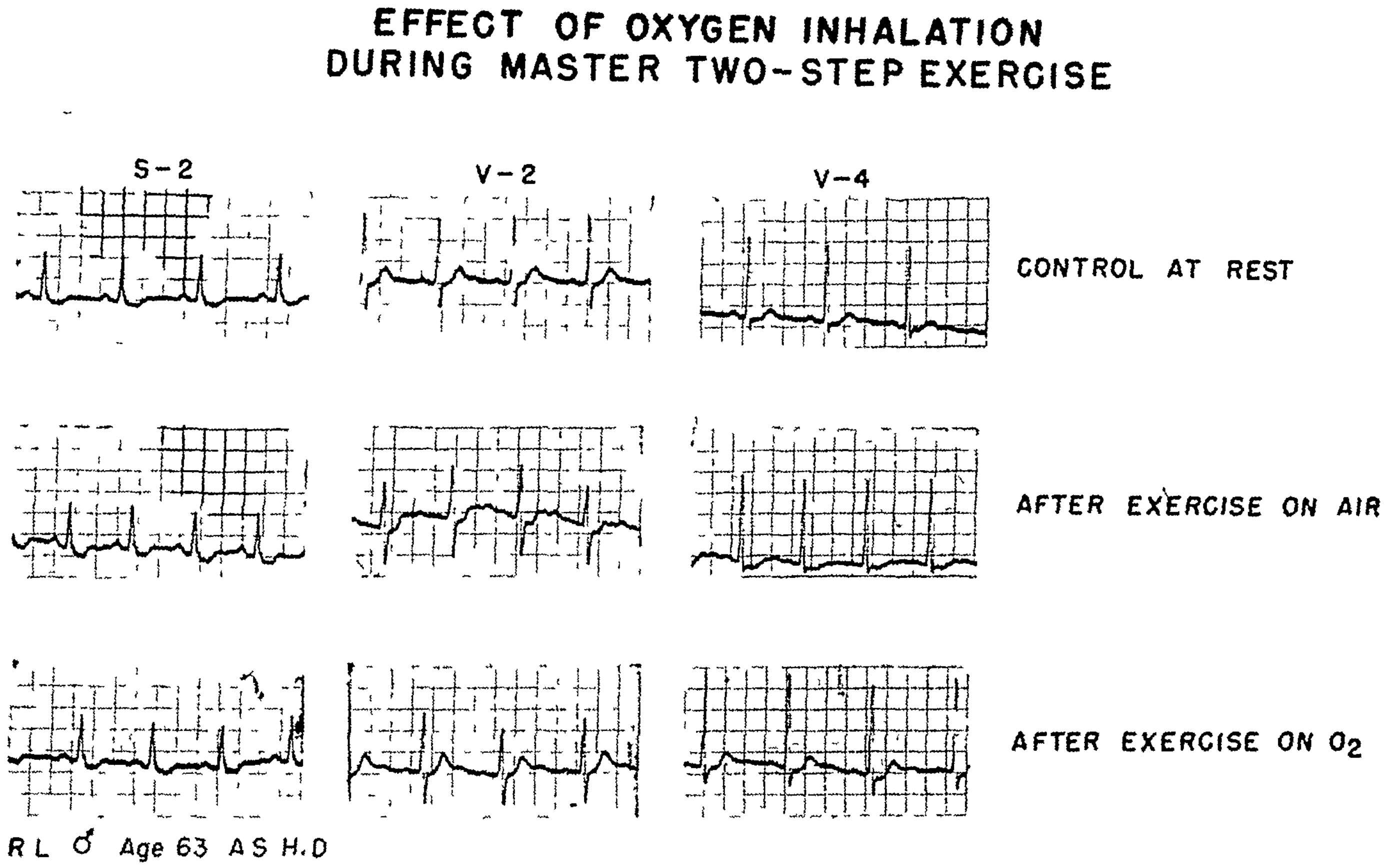


Fig 4—Response of a 63-year old male patient to Master two step exercise revealed characteristic S T and T changes, and anginal pain at conclusion of test when breathing air Same exercise carried out two hours later with simultaneous inhalation of oxygen in a disposable plastic mask at flow of 12 liter per minute showed no significant electrocardiographic changes No anginal pain or other symptoms were seen

Comment

Hingson,[17] who recommended that oxygen be carried in the doctor's satchel, stated that, in many cases of acute hypoxia, oxygen constituted the most essential element for saving life, lack of oxygen being the manifest precursor of death in many clinical entities, fatal accidents, under anesthesia, in fires and military disasters, he reported that a portable apparatus which employed three-liter oxygen cylinders, with soda lime and a rebreathing system, was used successfully in 2 cases of cardiac standstill and 28 cases of serious respiratory arrest during anesthesia and as a result of traffic accidents The same three-liter cylinders are used in the pocket oxygen device but without soda lime and with a venturi mouthpiece by which air is premixed with oxygen to provide concentrations of oxygen between 26 and 50 per cent Since the dispenser device with 10 additional cylinders can provide 33 liters of oxygen, this device may be carried by the patient or the physician with a number of additional cylinders

For longer continuous oxygen therapy, the larger light-weight cylinders containing 75 to 155 liters of oxygen are recommended with the device to refill them from a large cylinder, as seen in Figure 1 These oxygen cylinders when equipped with two-stage regulators provide an unvarying flow of oxygen and are therefore suitable for properly regulated oxygen therapy They may be carried in the doctor's bag or in his car, in a separate case, and they may also be at hand for the patient at home who has been instructed in their use

The value of an earlier use of oxygen in the treatment of coronary thrombosis warrants renewed consideration The findings in the two cases of convalescent coronary occlusion tested with the dispenser apparatus reveal significant changes, the arterial oxygen tension increasing in one instance from a normal level of 100 mm Hg to 235 mm Hg after inhaling 40 per cent oxygen for one minute, and in the other case, the arterial pO_2 rose from 65 to 165 mm Hg Although the percentage of cases of severe coronary insufficiency that will be critically helped by prompt oxygen administration cannot be predicted, the increased oxygen in physical solution in the collateral blood vessels would appear to lessen hypoxia of the heart muscle

It is well known that the patient who has peripheral circulatory failure in association with a sudden occlusion cannot be given nitroglycerin without hazard and that no such hazard accompanies the use of oxygen In the correspondence section of THE JOURNAL, the collapse of a patient with severe chest pain 20 minutes after ingestion of 0 6 mg of glycerol trinitrate was discussed as a potentially harmful procedure[18] 'Nitroglycerine is hazardous in the acute phase of acute myocardial infarction and should not be used If the patient is first seen in his initial attack of cardiac pain, this drug should not be administered until the diagnosis of acute myocardial infarction has been excluded In the presence of fresh coronary occlusion, administration of nitroglycerine may lead to a fall in blood pressure and precipitate massive infarction or death"[19]

Summary

Clinical and physiological evidence relevant to the therapeutic use of oxygen in coronary thrombosis and coronary insufficiency has been presented

The studies here reported have these indications 1 The arterial oxygen pressure can be increased more than twofold as a result of breathing 40 per cent oxygen from a pocket oxygen dispenser, the data were obtained from patients with convalescent coronary thrombosis 2 In cases of coronary artery disease, performance of the Master two-step test frequently induced abnormalities in the electrocardiogram which were not present when a subsequent test was conducted during inhalation of oxygen 3 Technical development of portable oxygen apparatus suitable for the doctor's bag and for ambulatory use by the patient himself makes possible an earlier employment of oxygen treatment than was formerly feasible

Whether it is now indicated to have the doctor as well as the patient with known coronary disease carry oxygen with him is propounded

929 Park Ave (28) (Dr Barach)

The Oxy-Hale was provided for this study by Controlled Pressure, Inc, Erie, Pa

The determinations in Figure 3, made by the polarographic method and checked by blood gas measurements, were carried out by Robin W Briehl, M D, Cardio-Respiratory Laboratory, Columbia Presbyterian Medical Center, Alfred P Fishman, M D, Director

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Relentless Shock

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Hypotension lasting many days is illustrated by two case histories. In a 61-year-old man it followed coronary occlusion and myocardial infarction, in a 74-year-old man it appeared on the second day after abdominal surgery. In both cases constant treatment with metaraminol bitartrate or other vasopressor drugs became necessary, and interruptions of such treatment were regularly followed by relapses into the hypotensive state, with signs of vasomotor collapse. It was found possible to terminate vasopressor medication on the 55th day in the first patient and the 22nd day in the second. These cases suggest many questions as to the definition, mechanism, and treatment of shock, especially since there was no evidence of reduced cardiac output as the fundamental mechanism in the second case.

THE encounter at the bed-side with a deep fall of blood pressure is always potentially perilous. Some of the views about the problem are divergent, and knowledge of the basic issues of circulation during hypotension is limited.[1] Other things being equal, general consensus should exist about the following: (1) a multiplicity of pathogenetic mechanisms may be operative in grave loss of homeostatic blood-pressure control, (2) a form of serious hypotension exists for which no explanation is known and which passes under the name of primary or neurogenic shock, and (3) the outlook of critical hypotension of any kind depends upon the depth of the blood pressure fall, the degree of its reversibility, and its duration.

The causes of shock range from accidental to surgical trauma, hemorrhage, transfusion reactions, severe infection, myocardial infarction, anaphylaxis, intoxications, certain metabolic changes, and many other factors. Yet, regardless of the precipitating event, the components of clinical shock are widening of the vascular bed, depletion of the blood volume, with a shift of the ratio between the reduced bulk of the circulating fluid and the increased vascular space, diminished vascular resistance to the flow of blood, and, with certain reservations referred to later, low cardiac output.

Apart from the correction of oligemia and other possible deficiencies, the outlook in critical hypotension is largely determined by the contractile responsiveness of the vascular smooth muscle fibers. Recovery depends chiefly upon the capacity of the vascular smooth muscle coat to respond to stimuli. Vascular smooth muscle fibers which no longer adequately respond to impulses from well-chosen pharmacological agents tend to preclude reversibility of shock.

However, one may well humbly agree that "the fundamental mechanism of irreversibility is not understood,"[9] that its cause is uncertain,[5] and that how normal pressor conditions are abruptly or gradually restored is unknown.[9] Concerning the maximal duration of vascular collapse beyond which it is irrevocably fatal, one finds no exact statements in medical literature beyond a vaguely timed resignation in the face of prolonged shock. Only one author, to our knowledge, mentions a case of shock of as long as 24 days duration.[10] For pertinent discussion, two extraordinary instances of shock are presented.

Report of Cases

Case 1.—A 61-year-old Italian tool designer, with a record of myocardial infarction in his otherwise uneventful past, was seen because of acute substernal pain and nausea. He was given 0.25 grain of morphine, without relief. After two days of therapy at home he was admitted on Oct. 3, 1957.

When seen in consultation at the hospital, the patient appeared very sick, and his blood pressure had fallen to 70/50 mm. Hg. The electrocardiogram (ECG) showed evidence of a posterior coronary branch occlusion with myocardial infarction. The blood cholesterol level was 380 mg.% and the fasting blood sugar level was 135 mg.% and subsequently 120 mg.%. Only minimal signs of congestive circulatory changes were noted.

After immediate institution of the usual treatment for acute myocardial infarction, the patient began

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From St. Vincent's Hospital, Bridgeport, Conn.

improving, except for the hypotension From the moment his incipient vasomotor paresis had been observed, the patient was placed on a regimen of intramuscularly given metaraminol (Aramine) bitartrate[4] The blood pressure would rise after each injection of the drug, but no higher than about 120/70 mm Hg In order to maintain such level of arterial tension, it was necessary to inject 10 mm of metaraminol bitartrate every hour

On Oct 7, in the face of a seemingly good course except for a blood pressure ranging between 72/50 and 118/68, mm Hg, an attempt was made at alternating administration of mephentermine (Wyamine) sulphate, 30 mm , with that of metaraminol bitartrate, 10 mm The alternating intramuscular injections were given at first each hour and later every two hours At no time could a higher reading be obtained than 120/70 mm Hg, and a hoped-for synergistic effect was obviously absent Also, any attempt at reducing the frequency of injections caused a rapid fall of blood pressure to 70/50 mm Hg, tachycardia, small pulse, and diaphoresis

Under such potentially life-threatening circumstances, the treatment was changed to intravenous administration of l-arterenol (Levophed), 4 mm in 500 cc of 5% dextrose in water On a dosage of 30 drops per minute, the flow lasted about five hours As with the previously employed drugs, the response of the blood pressure was prompt—from 80/60 to 150/80 mm Hg within 15 minutes—and remained satisfactory to the end of the infusion Soon afterwards, the patient broke out in a cold sweat, the pulse rate fell to 40 per minute, and the blood pressure could not be read Advisedly, another infusion of l-arterenol was not started because of the known temporary impairment of the effectiveness of l-arterenol as a vasopressor when cessation of its infusion is followed by a secondary blood pressure fall[2] Instead, meteraminol bitartrate (10 mm) was again immediately injected intramuscularly This raised the blood pressure to 130/70 mm Hg, and the patient's general condition improved From then on, for fear of catastrophic consequences, metaraminol bitartrate was depended on, administered at a rate of 10 mm each hour

As the end of a fortnight was nearing without lasting reversal of the hypotensive state, physical examination and serial ECG tracings revealed no new changes Roentgenographic visualization of the chest merely showed evidence of mild pulmonary congestion Nevertheless, the patient was digitalized, and further therapeutic measures were employed, as follows Between Oct 15 and Nov 7, treatment included administration of corticotropin, corticosteroids, and desoxycorticosterone acetate (DOCA), in addition to metaraminol bitartrate Yet, at that time, as before, this attack upon the problem from a hormonal angle was of no more appreciable benefit than the use of metaraminol bitartrate alone The latter could be relied on to raise the blood pressure and maintain it at a level of about 150/90 mm Hg for about one and one-half hours After that it would fall again to about 90/50 mm Hg, and signs of severe shock would ensue unless metaraminol bitartrate was injected

The maximal response to each metaraminol bitartrate injection was reached within 15 minutes, and the decline was very gradual However, the dosage had to be increased up to 50 mm

On Nov 21, still without any sign of longer safe intervals between injections of metaraminol bitartrate, stripping of one carotid sinus was decided upon The surgical procedure was carried out uneventfully by Dr Joseph P Shea, but the denervation of the right carotid sinus brought about no noticeable change in the blood pressure A brief attempt at breaking the deadlock by the administration of methoxamine (Vasoxyl) hydrochloride was a total failure, and the giving of metaraminol bitartrate once more proved to be absolutely indispensable

Within a few days, however, the long-since normal temperature increased to 101 5° F (38 6 C), and a coarse tremor developed It occurred in short spells and involved the head and the distal parts of the extremities The appearance of the flapping hands was reminiscent of hepatolenticular disease, and a wild stare was associated with such episodes Frequently, the patient became irrational and confused

Again, repeated physical examinations, urinalyses, chest x-ray studies, ECG tracings, and blood and urine cultures yielded no revealing findings Electrolyte levels (phosphorus, calcium, sodium, potassium) were also satisfactory, and heart failure was not present, probably thanks to the continued use of digitalis and moderate salt restriction The tremor did not abate, the temperature ranged between 101° and 103° F (about 38° and 39° C), and the patient experienced some dysphagia

Antibiotic and antipyretic (Aspirin) medications were given, and, on Nov 23, intramuscular administration of metaraminol was replaced by the oral giving of tablets in doses of 25 mm once or twice each hour Fortunately, the peroral route proved to be quite dependable and effective over increasingly longer intervals between medication The drug was needed only once, on Nov 27, and from Nov 28 on its use was discontinued

This final relief of the 55-days-long state of hypotension, with no further need of vasopressor medication, unfortunately was not yet the end of the patient's illness The fever, the tremors, and the episodes of disorientation and hallucination remained Also, in spite of the lack of any clinical or laboratory demonstration of an infection, the white blood cell count rose remarkably high, ranging between 28,000 and 46,000 per cubic millimeter from

Dec 2 to Dec 6 Also, myelocytes and toxic granules in the neutrophile cells occasionally appeared

On Dec 6, the patient was seen in consultation by Dr H M Marvin Regardless of all the sterile blood cultures, the possibility of a severe, undetermined infection was considered which had resisted antibiotic therapy (penicillin, chloramphenicol [Chloromycetin], oxytetracycline [Terramycin]) On the same day, Dr Marvin discussed the situation with Dr Paul Beeson, who regarded it not as an infection but as a reaction to the protracted use of metaraminol bitartrate It was decided to stop the use of antibiotics, and corticosteroids were given instead When the patient was administered prednisolone, three times a day for several days, the fever ceased, the white blood cell count decreased to about 8,000 per cubic millimeter, and the blood cultures, as before, showed no growth The patient's mental state cleared completely, and he was entirely rid of the tremors On Dec 17, 1957, he was discharged from the hospital, fully recovered His blood pressure was stabilized at about 112/65 mm Hg Subsequently, he resumed his regular position

Case 2 —A 74-year-old widowed attorney had complained of "gas" in April, 1956 Roentgenographic findings were then interpreted by the roentgenologist as "minute superficial ulcerations in the lesser curvature of the stomach, in healing process no evidence of neoplastic disease" After an uneventful interval the "gas" returned in June, 1957, and repeat roentgenographic examination now disclosed an "obstructing lesion in the region of the pyloric canal which is almost complete"

There had been a recent weight loss of 13 lb (6 kg) and a gradual onset of anorexia and weakness, on one occasion, the patient vomited food eaten many hours before The patient's distress was more severe than usual after he ate solid food He was admitted to Saint Vincent's Hospital on Aug 16, 1957, with a tentative diagnosis of carcinoma

The patient was alert, cooperative, and in no discomfort There was no obvious wasting The palpable lymph nodes, especially those in the supraclavicular fossae, were not remarkable The chest was clear The blood pressure was 130/90 mm Hg A harsh systolic murmur was audible at the apex cordis and at the aortic area, but no thrill was felt The apical heart rate was 80 per minute The cardiac rhythm was irregular because of premature contractions of ventricular origin (ECG) The abdomen was nontender but slightly distended The prostate was smooth, symmetrically enlarged, nontender, and otherwise not remarkable

The patient had a few days of preparation in the hospital prior to surgery This included a gastric analysis anl lavages twice a day Electrolyte studies yielded satisfactory findings

Operation—On exploration of the abdomen, adhesions were found in and around the head of the pancreas, pylorus, and duodenum A fairly large inflammatory mass was present in the head of the pancreas Pathologists were asked to view this, and all concerned felt it was inflammatory rather than neoplastic A subtotal gastrectomy was performed, during which the patient received 1,000 cc of a solution of 5% dextrose in distilled water and 1,000 cc of dextran (Plavolex) The anesthesia was endotracheal and was induced by gas, oxygen and ether with succinylcholine The operative course was very smooth, blood pressure ranged between 120 and 180 systolic, with a pulse range of 80 to 98

The postoperative course for the first 36 hours was entirely uneventful He walked the night of surgery and three times the day after surgery During this time he was maintained on nasogastric suction and was given fluids intravenously

On Aug 21, the morning of the second postoperative day, he complained of "aching in shoulders and arms, no pain" He had moderate diaphoresis His blood pressure was 110/68 mm Hg Radial pulse was 62 per minute and was irregular and of poor volume Subsequently, the house officer found the pulse to be totally irregular, with an apical rate of 200 per minute and a blood pressure of 98/68 mm Hg He also noted fine basal rales

These findings and the impression of auricular fibrillation were subsequently confirmed On the same day, administration of metaraminol bitartrate in 10 mm doses was started intramuscularly, and the patient was digitalized and given fluids intravenously and a blood transfusion of 500 cc During that day seven injections of metaraminol bitartrate were needed in order to sustain the patient's blood pressure at 125/90 mm Hg The blood pressure would respond promptly to each dose but would fall down below 80 systolic (diastolic unknown) within less than an hour and a threatening picture of vasomotor collapse would ensue at once the extremities would become cold and clammy, the radial pulse would be barely palpable, and the patient would sweat profusely and often lapse into coma with frequent muscular twitching

On Aug 22 the lung bases had become clear and no evidence of congestive circulatory changes could be found anywhere The paroxysm of auricular fibrillation had ceased, to be followed by occasional short spells of premature contractions

However, an unmitigated tendency towards peripheral vascular collapse became firmly established For the following 21 days, the patient required constant attention and watchful administration of metaraminol bitartrate at intervals of one to one and one-half hours in order to forestall another acute development of vasomotor paralysis The use of corticosteroids was without value

At one time, a briefly depressed serum chloride level was promptly coped with by the intravenous use of calcium chloride while, simultaneously, digitalis was temporarily withheld Except for that minor occurrence, electrolytes, blood counts, urinalyses, ECG tracings, temperature, food intake, and bowel function remained satisfactory, there was some diuresis Signs and symptoms of congestive circulatory failure were consistently absent Thus, failure of peripheral vascular homeostasis continued to be an isolated disturbance, without a demonstrable cause or further complication

A change took place on Sept 3, with the appearance of pyuria, fever, shaking chills, and the growth of a coliform organism in the urine culture Also, phlebitis and cellulitis ensued in the lower extremities at sites where intravenous cannulas had been inserted Administration of antibiotics and other conservative treatment was followed by uneventful recovery from those complicating episodes within several days

From Sept 6 on, the intravenous administration of metaraminol bitartrate was no longer needed From Sept 11 on, it was possible to discontinue the administration of metaraminol tartrate permanently, even by mouth Up to then repeated attempts at prolonging the intervals between this medication by any route had not been successful During these last few days, it was possible to withdraw the medication with impunity

The patient became ambulatory, and he was discharged from the hospital on Sept 18 After a few weeks of convalescence at home, he returned to his profession

Pathogenetic Considerations

Most physicians concerned with the study of cardiovascular disease have observed many an instance of salutary lowering of the blood pressure in certain hypertensive patients after a coronary artery thrombosis or a cerebral artery thrombosis or hemorrhage Such limited lowering of the blood pressure may endure thereafter at a satisfactory level without the previously needed antihypertensive therapy The relief from preexisting severe hypertension may last months, years, or indefinitely No cogent explanation of this occasional phenomenon exists, to our knowledge

Compelling questions arise from such observations 1 When critical, unrelenting, peripheral vasomotor paresis occurs, as in our two patients whose cases are reported above, is the basic nature of the event essentially the same as in the welcome lowering of the blood pressure after a vascular accident in some formerly hypertensive subjects? 2 Is this mechanism also the same as in fleeting shock after a vascular accident or after surgery? 3 In all such situations, is there merely a quantitative difference in severity and perseverance of the same pathophysiological process?

With due allowance for the limited understanding of the exact nature of failing homeostatic blood pressure control, the following statement may be a reasonable reply to these queries In the considered instances, the fundamental mechanism is most probably the same, provided specific, primary entities have been reliably ruled out, such as latent hypocorticalism, serious electrolyte imbalance, extreme blood loss, carotid sinus hypersensitivity, critical infection, intoxication, and central paralysis through excessive anesthesia In the absence of any specific primary cause, we are facing the provocation of a hitherto unexplained, more or less intense vascular atony, especially of the arteriolar muscular coat and capillaries

How and why does such functional failure follow uneventful surgery, a cerebral vascular accident, or myocardial infarction even in the absence of greatly reduced cardiac output? Why is the responsible pathogenetic mechanism short-lived in some instances and persevering in others? Why is it entirely resistant to therapy and ultimately fatal at times? Why, in some formerly hypertensive patients, is this impairment of neuromuscular function in the vascular tree operative only to the extent of a beneficial reduction of the blood pressure? In other words, what governs the degree of the peripheral vasomotor failure and its duration? To all such questions pertaining to this morbid process and its variable manifestations a final, convincing answer is not possible in the face of confusing evidence on the basic causes of shock"[6]

This statement is made in full awareness of much research, animal experimentation (with mainly traumatic shock), and demonstration of certain substances of pertinent interest, such as vasodepressor material Insofar as the fundamental mechanism is concerned, the literature on the general subject of shock sheds no piercing light on that particular form of vasomotor paresis which is often called neurogenic shock for lack of due concern with the probable role of altered reactivity of the vascular smooth muscle coat itself, no less than its autonomic innervation In the last analysis, in hypotension as in hypertension,[13] it is the vascular smooth muscle fiber which functions as the executive organ of vascular tonus

The much-blamed reduction of cardiac output undoubtedly initiates, at times, development of shock, but it does not constitute the *modus operandi* of the vasomotor failure In the patient in case 1, the blood pressure had fallen to 70/50 mm Hg, while but *minimal* congestive rales over the lung bases were audible and no other signs of heart failure were present Certainly, long after his heart had fully recovered from the infarction, it was not a reduced cardiac output that was operative in the 55-days-long picture of shock In the patient in case 2, as well, during a period of total absence of heart failure, shock remained an isolated phenomenon neither traceable to reduced cardiac output not associated with any other complication

It is noteworthy, in this connection, that a noncardiac patient in severe shock after a cerebral vascular accident may suffer general tissue anoxia, including myocardial ischemia, serious enough to cause a reduced cardiac output In such and similar situations the reduction of cardiac output follows the onset of shock, it is an effect, not the cause, of shock Such reasons tend to invalidate the generalization of reduced cardiac output as the "fundamental mechanism common to all disturbances which may lead to shock"[5] It is far more plausible that "the abnormally low cardiac output characteristic of shock is ordinarily a phenomenon secondary to inadequate venous return to the heart"[12]

Morbidity and Therapy

The duration of critical hypotension over a period of 55 days is, to our knowledge, reported here for the first time The termination of vasomotor failure occurred rather rapidly in both patients and could not have been predicted in either one or the other This kind of experience with swift rehabilitation of spontaneous vasopressor function and more or less abrupt recovery is in harmony with observations in many instances of shock No reason is known why vasomotor failure ceases gradually in some patients and quickly in others[9]

In the patient in case 1, shortly before the termination of clinical shock, the manifestations of acute hepatic disease presented challenging alternatives did he have iatrogenic liver damage from the prolonged use of metaraminol bitartrate or acute hepatic insufficiency[5] brought on[8] by shock itself? Hepatic encephalopathy[8] precipitated by shock in man has been referred to authoritatively, just as metaraminol bitartrate has been found in leading quarters to be the most satisfactory[7] vasopressor drug in cirrhosis of the liver with encephalopathy Conversely, liver damage due to experimental administration of metaraminol bitartrate has been reported in dogs[11]

We would not venture to suggest a final answer in our patient as to whether his hepatic encephalopathy was a toxic effect or metaraminol bitartrate or the result of prolonged shock However, it would seem to be a reasonable conclusion that the leukemoid complication in the same patient was induced by metaraminol bitartrate

As is reported by most others[16] giving favorable recommendations for metaraminol bitartrate, this drug, in both of our patients, was literally lifesaving Other vasopressor drugs and cortical hormones as well as the usual measures employed in shock, either singly or in combination, were of little avail by comparison Nor was the benefit from the use of metaraminol bitartrate augmented by any other drug It was of interest to note that this drug was no less effective when given perorally than when administered by the subcutaneous or intramuscular routes It was also reassuring to see no undesirable local changes at injection sites, in view of tissue necrosis and slough reported from one source after intravenous infusion of metaraminol bitartrate[15] In the patient in case 2, phlebothrombotic changes occurred after intravenous infusions of medicaments other than metaraminol bitartrate, but intramuscular or subcutaneous administration of metaraminol bitartrate caused no untoward results

A point worth keeping in mind concerns the secondary decrease in blood pressure shortly after infusion of l-arterenol When this happens, a repeat dose of l-arterenol is not advisable because, subsequent to the preceding infusion, the drug temporarily loses its pressor effect Fortunately, such impairment does not take place when metaraminol bitartrate is used periodically

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Recent Advances in Treatment of the Cancer Patient

Introduction to the Problem

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I HAVE been assigned the privilege of making introductory remarks in this symposium on recent advances in treatment of the cancer patient Actually, more advances have been made in the past 15 years in the various fields of cancer than in centuries preceding this time Most of the dramatic discoveries have been in research, some of these are basic, with *the true significance as yet* unknown The advances in the treatment of the patient are almost as significant as in other phases of cancer The advances under discussion today may be classified in four groups (1) surgery, (2) radiation, (3) chemotherapy, and (4) immunology The latter three might appear unrelated to surgery but actually are related, because radiation and chemotherapy are already being used in conjunction with surgical therapy, and immunology probably will be in the near future

This improvement in surgical results in the past 10 to 20 years has been related to (1) an increase in the amount of tissue excised with the tumor, (2) an improved knowledge of surgical physiology (better preoperative and postoperative care), and (3) better anesthesia It is rather apparent that we cannot expect much improvement by increasing the extent of operation, because the limit of operation is already extended to vital structures

Preoperative Diet

Of the various procedures and techniques utilized in improving the operability of patients with cancer, correction of malnutrition is unquestionably the most important It has only been during the past 10 or 20 years that we have realized the importance of correcting malnutrition in order to reduce the mortality rate following operations for cancer In fact, this is without question the most important factor in this reduction of operative mortality rate

More progress in the treatment of cancer has been made in the past 15 or 20 years than in many preceding decades It has been shown that improving the nutritional status of the patient preoperatively *will decrease morbidity and mortality* The tumor must be handled gently at the operating table as well as preoperatively Soap and-water preparation of the skin over a palpable tumor should be avoided Irrigation of the wound with anticancer agents to kill cancer cells is effective in animals and deserves a trial in human beings Blood vessels supplying the tumor area should be ligated early in the operation to prevent vascular spread of dislocated cells Perfusion and adjuvant therapy deserve clinical trial, but better anticancer drugs must be found before dramatic results from these procedures can be expected

The vast majority of patients with cancer, except those with asymptomatic lesions discovered by a detection examination, suffer from a variable degree of malnutrition, which is exemplified by loss of weight I would estimate that the average loss of weight in patients with cancer of the gastrointestinal system, e g , stomach, colon, and rectum, during the several months preceding admission to our hospital, would be 12 to 16 lb *It is not possible* and, in fact, is not necessary to regain all the lost weight However, if the weight loss has been, for example, 15 or 20 lb , I insist that 4 or 5 lb be regained

Anorexia is a common symptom in nearly all patients with cancer At times, insistence upon a greater caloric intake, with selection of proper food which the patient likes, will be sufficient to

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Read before the Section on General Surgery at the 109th Annual Meeting of the American Medical Association Miami Beach June 15 1960 obtain this weight gain However, most patients with cancer of the gastrointestinal tract, oral cavity, and many other areas will be unable to eat more than 800 to 1,000 calories per day By inserting a soft plastic tube through the patient's nose into the stomach, it is often possible to give the patient another 800 to 1,000 calories However, this combined oral intake is not sufficient to obtain a weight gain Intravenous-fluid administration will therefore be necessary One or two liters of 10 per cent fructose and 5 per cent amino acids and 500 cc of fat will furnish an additional 1,350 to 1 900 calories, extending the total to between 3,150 and 3,700 calories This will without exception produce an appreciable weight gain, unless there is an intestinal fistula or some other source of nutrient loss By this procedure it has been possible to achieve a weight gain of 4 or 5 lb in as many days

Most of my patients who have lost weight due to cancer have anemia and hypoproteinemia The anemia must be corrected preoperatively with blood transfusions If the transfusions do not correct the hypoproteinemia, plasma and human serum albumin should be given Care must be taken not to misinterpret the laboratory determinations of blood protein Often, indeed, there is a sharp reduction in food intake over a period of weeks, with weight loss but with normal blood-protein contents In this situation we must be aware of the misleading figure, because we know that in many patients, the blood level of proteins will be held at a normal or near-normal level, even though protein intake has been far below normal for weeks

Technical Aspects of Surgery

I am strongly of the opinion that soap-and-water preparation of the skin should be avoided as the cleansing process preliminary to the incision in the patient with cancer, particularly if a nodule is palpable Soap-and-water preparation is very effective in cleansing the skin, however, the manipulation or massage required to obtain this cleansing action would produce enough manipulation to dislodge cancer cells in many of the patients The danger of dislodgment of cells would be much greater if the nodule were palpable However, the manipulation required by the soap-and-water preparation of the abdomen might dislodge cells from a tumor even though the mass was not palpable I advocate the use of an antiseptic which is gently applied with a sponge

The wound must be kept covered as the operation progresses If this is not done, cells which are displaced from lymphatics or venules might be implanted into the wound and thus give rise to a local recurrence In my estimation, a high percentage of local recurrences are due to this mechanism of displacement of cells Covering the wound would minimize contact of the raw tissue with cells during the operative manipulation

Also, we must avoid manipulation of the tumor to minimize dissemination of cells This precaution should be utilized preoperatively as well as during the operation Whenever possible, the tumor should not be touched during the operation, once operability has been determined It is possible to maintain these precautions in tumors of the intestine, but in other areas such as the neck a certain amount of manipulation during the operation will be necessary In fact, this complication may be one of the factors giving rise to the high percentage of local recurrences following operation for malignant lesions of the neck Ordinarily, manipulation of the tumor would encourage vascular dissemination, but with neck lesions the vascular dissemination is not as common as dissemination by lymphatics and contiguity

Whenever possible, the vascular trunks leading to and from the tumor should be ligated[1] early in the operation This procedure should be utilized to prevent the dislodgment of cells from the tumor and then dissemination elsewhere throughout the body Actually, this precaution can be exercised effectively in most major operations for cancer One of the operations in which this procedure might be difficult to achieve is abdominoperineal resection for cancer of the rectum However, even in this operation, a large portion of the blood supply can be controlled by early ligation of the superior hemorrhoidal artery and vein

If the operation is being performed for a carcinoma of the intestine, the lumen of the bowel should be ligated[2] several inches above and below the tumor as soon as operability is determined, and before operative manipulation is begun This procedure maintains isolation of the malignant cells in a comparatively small segment of intestine, the excision will extend beyond this isolated segment I have learned that this procedure, perhaps augmented by irrigation of the lumen of the bowel before the end-to-end anastomosis is performed, will almost completely eliminate local implantation at or near the suture line

Numerous authors have demonstrated that irrigation of the wound during an operation for cancer will yield cancer cells in 20 to 50 per cent of cases, depending upon the type of operation being performed It is granted that perhaps the majority of these cells will not survive However, if their survival can be minimized by a procedure such as irrigation with an anticancer agent, it appears that such a mechanism would be justifiable Our experiments with animals indicate that, of about 25 or 30 chemicals tested, nitrogen mustard (2 to 5 mg per cent) and sodium hypochlorite (0 5 per cent buffered to a pH of 9 0) are about equally effective in minimizing the growth of cells inoculated into wounds of animals[3] If irrigation is utilized, we are quite convinced that a time element of three to five minutes is required for the irrigation to be effective

Perfusion with Anticancer Agents

The perfusion treatment with use of a pump and oxygenator as popularized by Creech and associates[4] promises to be an effective mechanism in the treatment of cancer, particularly of the advanced type Stehlin and associates[5] have also had extensive experience with this mechanism of treatment

The advantage of this mechanism of therapy lies in the fact that the tumor can be exposed to a much greater amount of anticancer drug In a recent report by Creech and associates[4] on their experience with 145 patients perfused, they indicate that the lesion was acquiescent in 55, and in 27 there was a temporary regression of the tumor There were eight operative deaths in this series In a recent published report, Stehlin and associates[5] emphasized the dangers of the perfusion and the precautions necessary to prevent toxic effect of the chemical Various anticancer drugs, including nitrogen mustard, phenylalanine mustard, triethylenethiophosphoramide, actinomycin D, 5-fluorouracil, and still other agents have been utilized in this mechanism of treatment by the various authors One of the lesions responding most readily to perfusion therapy is malignant melanoma Although the improvement recorded up to date in perfusion therapy has been purely temporary, it is logical to assume that if and when better drugs are available, a favorable response might be observed in a larger percentage of cases and might be permanent instead of temporary Accordingly, we may look with optimism on this type of therapy

Adjuvant Therapy

The relative efficiency of modern anticancer drugs, including nitrogen mustard and triethylenethiophosphoramide particularly, in preventing "takes" following inoculation of cancer cells in animals led us to utilize this procedure in the human being We[6] began this therapy in human beings in March, 1956 Since that time we have used adjuvant therapy with nitrogen mustard in about 110 cases of cancer of the breast and a slightly smaller number of patients with cancer of the colon and rectum Half of this group have been used as controls We have utilized a course dose of 0 4 mg per kilogram of body weight but give no more than 30 mg per course to any one patient In general, we give about half of this dose on the day of operation and the other half in two divided doses on succeeding days, postoperatively

The method appears to be yielding beneficial effects with carcinoma of the breast, but not with carcinoma of the colon and rectum In the breast series we have had 20 recurrences in the controls and 13 recurrences in the treated breast patients More important, however, is the number of deaths from cancer In the control series we have had 15 deaths from cancer and in the treated series only 6 However, in the colon and rectum series there has been no benefit, in fact, there were more recurrences and deaths in the treated series This series is so small that definite conclusions cannot yet be derived

Chemotherapy

Since the introduction of nitrogen mustard as an anticancer agent by Goodman, Gillman, and associates 15 years ago, there probably have been as many as 100,000 drugs tested for anticancer effect in animals A few hundred have shown effect on animal tumors, but only a few dozen have shown effect on human tumors Up to date this beneficial effect has been temporary The only drug which might be classified as yielding permanent results is methotrexate, used particularly by Hertz and associates at the National Cancer Institute Present experiments indicate that leukemia and lymphoma respond best to anticancer drug therapy Of the numerous drugs being tested at the present time, 5-fluorouracil (Fu) and 5-fluoro-2′-deoxyuridine (FUDR), introduced by the group in Madison, Wis, appear to be the most hopeful for solid tumors They report[7] that 53 per cent of 41 patients with cancer of the breast were improved with Fu, and 50 per cent of 14 patients with breast cancer treated with FUDR, 22 per cent of patients with cancer of the rectum or colon were improved with Fu, and 36 per cent of 14 cases in that group were improved with FUDR

Again, I must admit that the drugs being used at the present time as anticancer agents are not very effective I feel confident that better drugs will be found I already know of a few being experimented with throughout the country, including one in our own laboratory, which appear to be much more effective, at least in animals, than the compounds being used at the present time

Vaccines and Antibodies

A short time ago Friend[8] demonstrated that antibodies to a leukemia-like disease could be produced in mice She prepared these antibodies by injecting filtrates of the spleen of infected mice into rabbits, repeating the injection three times every third day Serum was collected 14 to 21 days after the last injection When this serum was given to mice inoculated with an active filtrate, only 16 per cent of the mice so treated developed leukemia, however, 90 per cent of the controls not inoculated with the antibodies developed the disease

Schwartz and associates[9] have demonstrated production of a similar immunity in mice with leukemia They achieved immunization by injecting a cell-free brain filtrate obtained from a mouse with leukemia into rabbits along with the bacterioadjuvant The rabbits were injected twice at five-day intervals, and they were bled ten days after injection Serum from these rabbits was injected intraperitoneally into adult C3H mice which were then inoculated with cell-free brain filtrate or tumor suspension of C3H leukemia Approximately 80 per cent of the controls challenged with cell-free brain filtrate for tumor-cell suspension developed leukemia However, in the animals injected with rabbit serum, only 10 per cent developed leukemia Stewart and Eddy[10] have likewise been able to make antibodies which will prevent the formation of tumors by the polyoma virus

It is very possible that as vaccines and antibodies are developed for human beings, they will be used to supplement surgical excision until the time comes when they will completely destroy all tumor, regardless of size There is evidence suggesting that until this utopian day arrives, they may destroy isolated deposits of tumor but not large masses

Perhaps the first evidence of the production of antibodies in human beings was the publication in 1955 of an article by Graham and Graham,[11] who used the complement-fixation test In 48 patients with various types of cancer they found that 12 patients had circulating antibodies to their own tumor The titer in these 12 patients ranged from 1 16 to 1 128 Of this group six exhibited a titer only after removal of the tumor Patients with antibodies had lesions which were in the comparatively early stage, whereas the majority of the patients not showing antibodies had advanced lesions

In a more recent paper[12] by these authors they reported on the method of producing vaccines for cancer patients, they used Freund's adjuvant to enhance the immune response In a series of 101 patients with various types of cancer and a poor prognosis, 55 lived seven months or more It was not possible to set up controls for these patients However, the authors were of the opinion that survival was prolonged by the use of tumor antigens injected into the patients The tumor antigens represented whole-cell suspensions, homogenates, and various saline extracts

The work of Southam and associates[13] is very important, insofar as they have demonstrated for the first time that the subcutaneous injection of cancer cells may survive in some patients but not in others They made 24 homogenous transplants with 7 cancer-cell lines (originally isolated from human cancer tissue and grown in heterologous hosts or tissue culture) subcutaneously into 14 patients with cancer In these patients a nodule developed at the site of inoculation five to ten days after injection of the cells Some of these nodules were removed early for microscopic study, in four patients recurrence of cancer developed at the biopsy site where the tumor had been removed In two of these patients the nodules grew progressively, in one of the two, metastases appeared in the axillary nodes

They injected these cell-line tumors into normal volunteers at the Ohio State Penitentiary The initial inflammatory reaction in the young people without cancer was more marked in degree and duration However, all of these implants started to regress spontaneously by the end of three weeks following inoculation, by the end of four weeks all had completely disappeared No recurrence was noted in any of the volunteers, at least for a period of five months These experiments indicate that patients with advanced cancer do not possess significant immune factors to destroy inoculated cancer cells but that young normal individuals without cancer possess some type of immune factor which would destroy the inoculated cancer cells

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Effects of Combined Drug Therapy on Metastatic Cancer of the Testis

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Advanced cancer of the testis was treated in 36 patients with different combinations of an alkylating agent, an antimetabolite and the antitumor antibiotic actinomycin D. Of 23 patients treated with the three classes of drug in combination, 12 gave evidence of tumor regression. Of 9 patients treated with an alkylating agent and actinomycin D, 2 showed resolution of pulmonary metastases. Of 8 patients treated with 6 mercaptopurine (6-MP) and 6 diazo-5-oxo-L-norleucine (DON), one responded. Of the 15 respondents, 10 had choriocarcinoma with or without embryonal carcinoma and teratocarcinoma or both. Tumor regression was associated with a fall of urinary chorionic gonadotropin titer. Side-effects occurred but proved reversible, and they were accepted as hazards of the treatment because of the striking improvement obtained in some cases.

EFFECTS on fetal development in experimental animals have been used as evidence of possible antineoplastic potency in the first line screening of various prospective cancer chemotherapy compounds. Fetal death or teratogenesis can be induced by the use of certain radiomimetic drugs as well as antimetabolites. Nitrogen mustard, chlorambucil, the folic acid antagonist amethopterin, and the glutamine antagonist 6-diazo-5-oxo-L-norleucine (DON), have been found to exert profoundly adverse effects on the early development of embryonic tissues.[1] More recently, actinomycin D has been reported as capable of inducing temporary regression in certain patients having metastatic Wilms's tumor, a fetal tumor of the kidney.[2] Cancer of the testis and choriocarcinoma of the uterus are considered embryonal in origin corresponding to the early stages of embryonic development. Uterine choriocarcinoma has been shown susceptible to treatment with either amethopterin or 6-diazo-5-oxo-L-norleucine. The majority of males having metastatic choriocarcinoma with or without elements of embryonal carcinoma and teratocarcinoma have not responded satisfactorily to either amethopterin or 6 diazo-5 oxo-L-norleucine.[3] In view of these facts, the previously mentioned three classes of drugs were used in different combinations in an attempt to obtain a wide range of anti-embryoma activity. This article presents the summary of clinical, laboratory, and therapeutic data of 36 patients having metastatic cancer of the testis which was treated by combined drug regimens. Preliminary reports of early experience with such regimens have been published in abstract form.[4]

Materials and Methods

The diagnosis in each case was based on histological, hormonal, radiological, and clinical evidence of metastatic disease. The pathological slides of the primary and secondary lesions, or both, were reviewed by members of the attending staff of the Department of Pathology of the Memorial Center for Cancer and Allied Diseases. The distribution of the histological diagnoses of the 36 patients is illustrated in Table 1. Of the 20 patients with choriocarcinoma, all had elevated urinary chorionic gonadotropin titers ranging from 700 to 2,500,000 I.U. per 24 hours. The bio-assays of urinary chorionic gonadotropin were made according to the standard ovarian hyperemia test in rats.[5] In our experience, the titer of chorionic gonadotropin did not reflect the total mass of trophoblastic tissue present but correlated well with the observable changes of tumor growth. Quantitative changes of the urinary chorionic gonadotropin titer often heralded a change in the progress of the disease much earlier than it was apparent clinically. A urinary titer of

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chorionic gonadotropin persistently elevated beyond 500 I U per 24 hours was considered an indication of trophoblastic growth, although physical and radiological examinations might not have revealed the presence of a tumor

TABLE 1 —Pathological Diagnosis in Patients Treated for Metastatic Cancer of the Testis

GROUP*	Pathology of Germinal Tumors	No
1	Seminoma†, pure	1
2	Embryonal carcinoma pure, or with seminoma	13
3	Terato, pure, or with seminoma	
4	Teratocarcinoma with or without embryonal carcinoma or choriocarcinoma, or both and with or without seminoma	4
5	Choriocarcinoma‡ pure or with either seminoma or embryonal carcinoma or both	16

* After A F I P Classification

† A few trophoblastic cells seen in one of 17 slides examined negative for urinary gonadotropin

‡ One patient found to have normal testes at autopsy Chorio carcinoma in mediastinum with widespread metastases

After many modifications of the dosage schedule the optimal method of administration of chlorambucil, amethopterin, and actinomycin D for adults appears as follows 1 Chlorambucil 10 mg and amethropterin 5 mg, is orally given daily for a period of 16 to 25 days 2 On the third day, actinomycin D, 0 5 mg is intravenously given daily for five consecutive days 3 The second five-day course of actinomycin D is started on the twelfth day of the regimen A third five-day course of actinomycin D is started on the twenty-first day All three drugs are discontinued after the twenty-fifth day of the regimen

Stomatitis or diarrhea and substantial bone marrow depression, or both, usually became apparent immediately after the discontinuance of the therapy Recovery from drug toxicity generally takes 7 to 14 days Nausea and vomiting frequently accompany the administration of actinomycin D, thus accounting for the interrupted actinomycin D therapy Nausea and vomiting are effectively alleviated in most cases with the administration of antiemetics Acneiform skin eruption and moderate loss of hair are common in patients treated with multiple courses of this regimen Daily appraisal of the patient's clinical status in terms of drug toxicity is essential, because an occasional patient will not tolerate the full course of therapy as described The appearance of stomatitis, diarrhea, a leukopenia below 3,000 per cubic millimeter and a thrombocytopenia below 100,000 per cubic millimeter is an indication to discontinue drug therapy until a full recovery is obtained

TABLE 2 —Clinical, Laboratory, and Therapeutic Data

Patients		Diagnoses and Previous Therapy	Extent of Disease Prior to Therapy	Therapy, Total Dose	Responses	Duration of Remission, Current Status
No,	Age					
1	37	Choriocarcinoma Right orchiectomy x ray therapy to pelvis, epigastrium, and para aortic regions	Large metastatic mass in right lower lung associated with cough and weight loss CGT* 1 000 I U 2 000 I U	Actinomycin D, 7 5 mg chlorambucil 260 mg	Complete disappearance of tumor in lung CGT negative Asymptomatic	12 months living and well
2	18	Embryonal carcinoma with trophoblasts Right orchiectomy Retroperitoneal node dissection, x ray therapy to lungs and pelvis Non functioning right kidney	Multiple metastases to both lungs bilateral large inguinal metastatic masses Cough, hemoptysis, chest pain neuropathy of right lower extremity weight loss chronically debilitated CGT, 2,000 I U	Actinomycin D 7 mg chlorambucil 240 mg	Partial but definite regression of metastases in both lungs CGT not done	4 weeks disease relapsed chlorambucil amethopterin and actinomycin D given no response dead
3	27	Teratocarcinoma, embryonal carcinoma choriocarcinoma Post left orchiectomy, post bilateral retroperitoneal node dissection, x ray therapy to mediastinum and abdomen	No clinical evidence of disease, except persistently elevated CGT 1 000→4 000 I U	DON 2 140 mg 6 mercaptopurine † 550 mg	CGT negative 1 month after onset of therapy	39 months living and well no evidence of disease
4	29	Embryonal carcinoma, seminoma Left orchiectomy, 1953 X ray therapy to abdomen Embryonal carcinoma seminoma, choriocarcinoma Right orchiectomy, 1957, and x ray therapy to abdomen	Mass in left neck Numerous metastases to both lungs CGT 20,000 I U Cough dyspnea chest pain, hemoptysis weight loss	DON, 840 mg epoxy piperzine ‡ 18 6 Gm actinomycin D 15 mg	CGT negative Complete disappearance of metastases of lungs and neck, asymptomatic, weight gain	7 months disease relapsed resistant to chlorambucil, amethopterin, actinomycin D therapy, and radiotherapy dead
5	29	Choriocarcinoma, embryonal carcinoma, teratocarcinoma Right orchiectomy, sperm vaccination DON and 6 MP, epoxypiperazine and actinomycin D actinomycin D, and DON	Multiple metastases to both lungs, neck and inguinal nodes CGT 300 000 I U Cough, hemoptysis, dyspnea, chest pain, weakness	DON, 400 mg, HN2, 66 mg actinomycin D, 10 5 mg	CGT, 0→1,000 I U	5 weeks later treated with chlorambucil and amethopterin and actinomycin D and mitomycin C no response dead
6	19	Embryonal adenocarcinoma Right orchiectomy, x ray therapy to pelvis, abdomen	Multiple large and small metastases to both lungs Cough, weakness, dyspnea, weight loss, fever	DON 100 mg HN2, 28 mg actinomycin D, 2 5 mg	Marked decrease in size of metastastes in lungs alleviation of symptoms	3 weeks later relapsed, treated with x ray DON and actinomycin D, no response dead
7	28	Choriocarcinoma Left orchiectomy	Multiple large metastases to both lungs, displacement of ureter by IVP CGT, 500,000 I U	Amethopterin, 290 mg actinomycin D, 34 mg chlorambucil 540 mg	Complete disappearance of all tumors in lungs CGT negative IVP, normal	18 months, living and well, no evidence of disease

* Chorionic gonadotropin titer (CGT)

† 6 diazo 5 oxo L norleucine (DON) 10 to 15 mg, and 6 mercaptopurine (6 MP) 100 to 200 mg postoperatively daily

‡ DON 15 mg postoperatively daily for 15 days and epoxypiperazine, 75 mg per kilogram of body weight divided into 5 daily doses

The maintenance therapy is generally given intermittently once every two weeks for the first two courses, once monthly until all objective evidences of disease have disappeared, and once every two months thereafter Therapy consists of a seven-day course with chlorambucil and amethopterin in combination plus a five-day course of actinomycin D, beginning on the third day Substantial laboratory and clinical improvement, if any, usually appears after the completion of the initial 25-day course of therapy In fact, during the first two weeks of the regimen there may be progression of disease, with regression evident only on continuation of drug therapy Experiences emphasize that pre-existing renal, hepatic, and bone marrow impairment may contribute to irreversible toxicity Hence renal, hepatic, and bone marrow functions must be carefully and frequently checked prior to and during drug therapy

Other drug combinations such as a nitrogen mustard (HN2) or epoxypiperazine (an active alkylating agent) plus 6-diazo-5 oxo-L-norleucine, with or without actinomycin D, 6-mercaptopurine and 6 diazo-5-oxo-L-norleucine in combination, have also been used (Table 2) The triple drug regimen using chlorambucil, amethopterin, and actinomycin D has proved most effective Some of these patients had received more than one combination of drugs, but were studied and evaluated separately

In patients with positive chorionic gonadotropin in the urine, frequent determinations were made before, during, and after therapy Serial chest roentgenograms and intravenous urograms, or both, were made at appropriate points during and after therapy Measurements of palpable or visible tumor masses were recorded frequently The clinical status of the patients, including body weight and observations of weakness, cough, hemoptysis, dyspnea, and pain were closely followed

Results

The results are summarized in tables 2 and 3

Effect of Combination of an Alkylating Agent, an Antimetabolite, and Actinomycin D —Of the 23 patients who were treated with the three classes of drugs in combination, 12 showed substantial objective laboratory and clinical (or both) evidences of tumor regression lasting from 1 to 18 months or more Of these 12 respondents, 7 showed complete or nearly complete disappearance of multiple pulmonary metastases and palpable tumors, and in patients who had choriocarcinoma, the response was associated with a disappearance of the previously elevated gonadotropin values Of these seven

Respondents with Metastatic Cancer of the Testis

Patients		Diagnoses and Previous Therapy	Extent of Disease Prior to Therapy	Therapy Total Dose	Responses	Duration of Remission Current Status
No	Age					
8	19	Choriocarcinoma Left orchiectomy	No clinical evidence of disease Persistently elevated CGT 100 000→ 160 000 I U	Amethopterin 140 mg actinomycin D 15 mg chlorambucil 560 mg	CCT negative	2 months living and well relapsed on therapy bilateral para aortic node dissection CGT remains 20 000 I U
9	31	Embryonal carcinoma Left orchiectomy CO⁶⁰ therapy to abdominal node area Metandren	Multiple large metastases to both lungs and mediastinum esophagus Dysphagia dyspnea hemoptysis lumbar pain	Amethopterin 320 mg actinomycin D 22 5 mg chlorambucil 640 mg	Complete disappearance of all metastatic tumor asymptomatic	9 months living and well no evidence of disease
10	59	Embryonal carcinoma right orchiectomy Retroperitoneal node dissection P 1 875	Several coin size metastatic masses in both lungs Dyspnea chest pain	Amethopterin 175 mg actinomycin D 12 5 mg chlorambucil 350 mg	Complete disappearance of all tumors	2 months living with recurrence under therapy no response
11	35	Embryonal adenocarcinoma Right orchiectomy	Numerous nodular metastase to both lungs Dyspnea and chest pain	Amethopterin 410 mg actinomycin D 26 5 mg chlorambucil 750 mg	Complete disappearance of all metastases Asymptomatic	9 months living and well relapsed again responded to therapy favorably
12	24	Choriocarcinoma primary unknown Right lumbar exploration and biopsy	Numerous nodular metastases to both lungs Cough hemoptysis renal vein thrombosis due to extensive retroperitoneal node metastases CGT 500 000 I U	Amethopterin 542 5 mg actinomycin D 31 9 mg chlorambucil 1 062 mg	Partial regression of pulmonary lesions CGT 10 000 I U Alleviation of symptoms no evidence of disease in retroperitoneal regions of autopsy	2 months relapsed resistant to further therapy dead
13	31	Choriocarcinoma teratocarcinoma Right orchiectomy	Numerous large and small metastatic tumors in both lungs IVP right hydronephrosis Chest pain cough hemoptysis CGT 2 500 000 I U	Amethopterin 457 5 mg actinomycin D 28 5 mg chlorambucil 902 mg	Nearly complete regression of all pulmonary metastases Asymptomatic normal IVP CGT negative	9 months living and well
14	50	Seminoma a few trophoblastic elements in one of 17 slides	Several nodular metastases to both lungs Cough	Amethopterin 145 mg actinomycin D 7 5 mg chlorambucil 290 mg	Complete disappearance of all pulmonary tumors with alleviation of symptoms	4 months living with recurrence under therapy no response
15	42	Embryonal carcinoma choriocarcinoma Right orchiectomy Lobectomy X ray therapy to upper chest	Metastatic nodules in lungs Dyspnea chest pain CGT 200 000 I U	Amethopterin 100 mg actinomycin D 6 5 mg chlorambucil 200 mg	CGT 0→5 000 I U	1 month inadequate therapy patient died of pulmonary insufficiency from radiation fibrosis

patients, three (patients 7, 9, and 13) have resumed full activity on maintenance therapy and were asymptomatic for 9 to 18 months or more, four had relapse of disease following a remission of 2 to 7 months There was no response when therapy was resumed in three patients (patients 4, 10, and 14), the other (patient 11) resumed extensive therapy and again responded favorably The remaining 5 of the 12 respondents showed temporary, but definite, tumor resolution as indicated by the appearance of the chest roentgenograms and fall of previously elevated chorionic gonadotropin titers or both Duration of the partial remissions varied from one to four months All except one of these five patients relapsed and died in spite of continuation of drug therapy

TABLE 3 —Comparative Results of Response of Different Drug Combinations for Patients with Metastatic Cancer of the Testis

Drugs	No of Respondents	Total Patients No	Total Patients %
Alkylating agent, antimetabolite actinomycin D	12	23	52 0
Two antimetabolites	1	8	12 5
Alkylating agent, actinomycin D	2	9	22 2
Alkylating agent antimetabolite		2	
Total	15	42	

Effect of an Alkylating Agent Plus Actinomycin D —Two of the nine patients treated with this regimen showed evidence of tumor regression These two respondents were treated with chlorambucil and actinomycin D in combination The dosages of these drugs and duration of treatment were as described previously with amethopterin omitted One of these two respondents showed complete disappearance of all clinical and laboratory evidence of disease for 12 months (patient 1) The other showed temporary but definite regression of some of the pulmonary metastases lasting for one month but died of progression of disease in spite of continued therapy

Effect of 6-mercaptopurine plus 6-diazo-5-oxo-L-norleucine —Eight patients were treated with this combination Only one (patient 3) responded, who had previously had a left orchiectomy for a teratocarcinoma mixed with embryonal carcinoma and choriocarcinoma The only evidence of disease was a persistently elevated chorionic gonadotropin titer (between 1,000 and 4,000 I U per 24 hours) in spite of retroperitoneal lymph node dissection and radiotherapy to mediastinum and abdomen after surgery The urinary chorionic gonadotropin titer became negative 3 weeks after starting 6-mercaptopurine and 6-diazo-5-oxo-L-norleucine in combination and has remained negative for 39 months

Effect of an Alkylating Agent and 6-diazo-5-oxo-L-norleucine Combination —Two patients were treated with this combination and were without therapeutic benefit

Case Reports

Case 1 (Patient 7) —A 28-year-old man first noted swelling of the left testis with a slight left lumbar pain in June, 1958 An orchiectomy was performed on the left testis on Sept 19, 1958 The pathological diagnosis was choriocarcinoma of the testis Postoperatively, an intravenous pyelographic examination showed changes suggestive of retroperitoneal lymph node enlargement The chest roentgenogram revealed multiple large metastases to both lungs He was referred to Memorial Center, for chemotherapy, in October, 1958 On admission, he had no complaints except for some weight loss Chest roentgenographic and intravenous pyelographic examinations confirmed the previous observations Physical examinations were negative for evidence of disease elsewhere The results of the hemogram and renal and hepatic function tests were within normal limits The urinary chorionic gonadotropin titers varied from 300,000 to 640,000 I U per 24 hours (Fig 1) He received intensive treatment initially and maintenance therapy with chlorambucil, amethopterin, and actinomycin D as previously described The urinary chorionic gonadotropin titer sharply declined and became negative shortly after the third five-day course of actinomycin D therapy and has remained negative on numerous determinations during the 18 months prior to this report Substantial regression of pulmonary metastases was evident in November, 1958, and he was free of all evidence of disease in June, 1959 Repeated intravenous pyelograms were negative This patient has had a 20-pound weight gain and resumed active work in March, 1959 As of May, 1960, there was no evidence of disease

Case 2 (Patient 1) —A 37-year-old man first noted a swelling of the right testis in December, 1955 A right orchiectomy was performed in January, 1956 The pathological diagnosis was choriocarcinoma From Feb 6 to April 6, 1956, radiotherapy was given to the pelvis, epigastrium, and para-aortic regions up to a 5,000 r total tumor dose Toward the end of 1958, he developed cough and mild dyspnea associated with a weight loss of 19 pounds by the end of 1958 In January, 1959, a chest roentgenogram showed a mass, 15 cm in diameter, in the right lower lung He was admitted to Memorial Center, for chemotherapy, in February, 1959 Physical examination and an intravenous pyelographic examination revealed no evidence of metastatic disease elsewhere The hemograms, renal, and hepatic function tests were within normal limits Chorionic gonadotropin titer was negative on admission, but was 700 to 2,000 I U per 24 hours on subsequent determinations Chlorambucil, in doses of 10 mg daily postoperatively was given from March 11 to March 30, 1959, actinomycin D, in doses of 0 5 mg daily was given intravenously from March 11 to March 15, 1959 Three similar courses

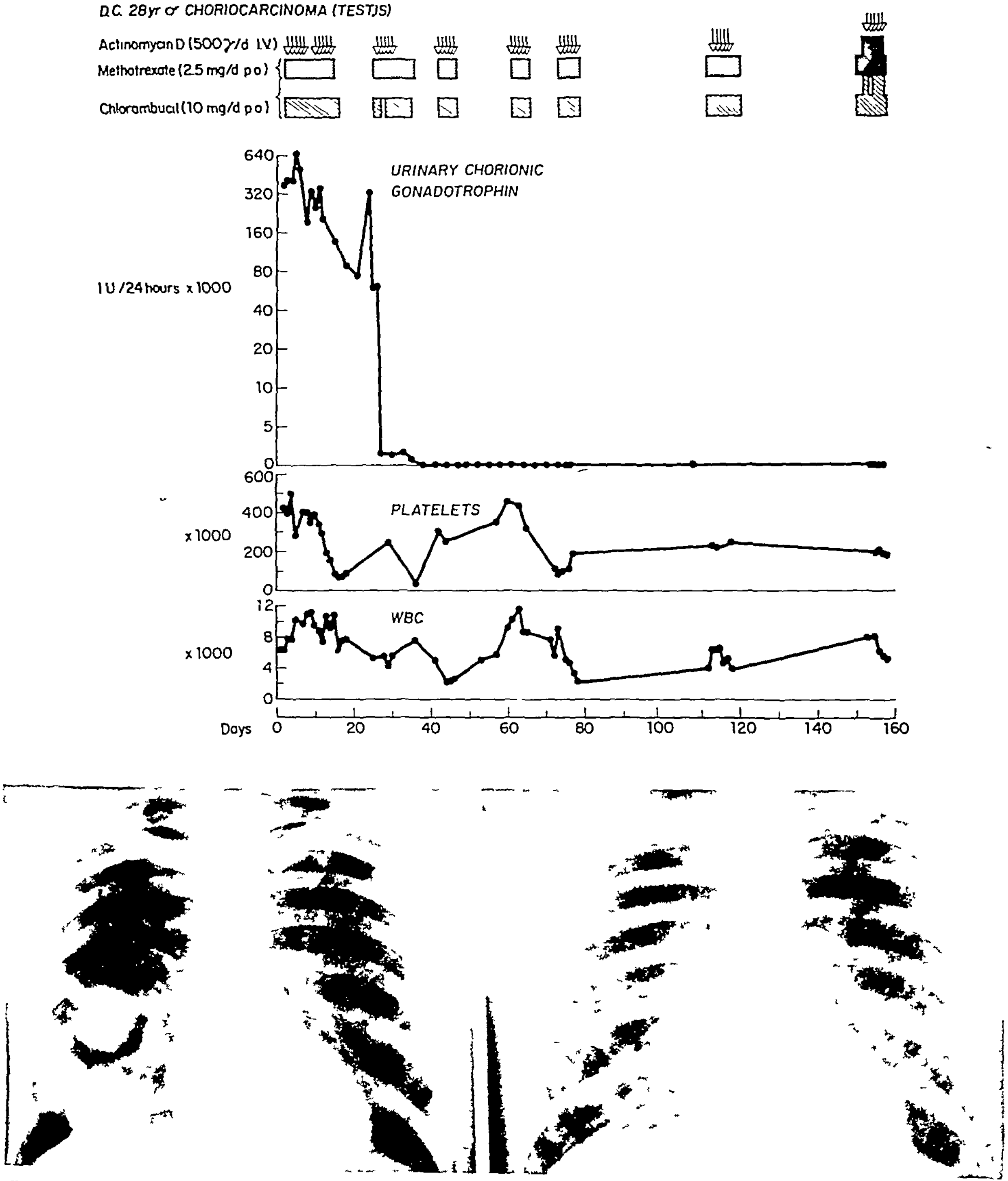

Fig 1 (case 1) —*Upper*, drug effect on urinary chorionic gonadotropin excretion *Lower*, drug effect on pulmonary metastases, chest roentgenogram taken Oct 15, 1958, prior to therapy

were given in April, May, and August, 1959, respectively Substantial regression of the pulmonary tumor was noted in April, and the tumor completely disappeared by September, 1959, (Fig 2) The patient has regained his original weight and has resumed active work, as of May, 1960, there is no evidence of recurrence of disease The urinary chorionic gonadotropin titers have been negative on multiple determinations since April, 1959

Case 3 (Patient 9)—A 31-year-old physician first noted severe discomfort in the left testis with left flank pain in October, 1958 On Feb 11, 1959, a left inguinal-scrotal orchiectomy was performed The pathological diagnosis was embryonal carcinoma

Postoperatively he received cobalt therapy to the retroperitoneal lymph node area up to a total of 4,800 r tumor dose A roentgenogram of the chest was negative in February, but showed numerous metastases to both lungs in May, 1959 A chest roentgenogram on July 21, 1959 showed considerable interval increase of all pulmonary metastases and an intravenous pyelogram was normal He was referred to Memorial Center for chemotherapy On admission, he complained of cough, chest pain, hemoptysis, dyspnea, dysphagia, left lumbar pain, and a weight loss of 12 pounds His physical examination was negative for evidence of disease elsewhere The urinary chorionic gonadotropin assays were negative on repeated examinations An esophogram revealed mediastinal masses compressing the lower third of the esophagus His hemogram and renal and hepatic function tests were normal He was started on intensive therapy on July 23, with chlorambucil, amethopterin, and actinomycin D, but therapy had to be stopped after 15 days because of drug toxicity Maintenance therapy was begun two weeks later Substantial objective tumor regression and subjective improvement were evident by the end of August, 1959 The patient became asymptomatic and was found completely free of evidence of disease both by physical and radiological examinations in May, 1960, and has resumed active professional work

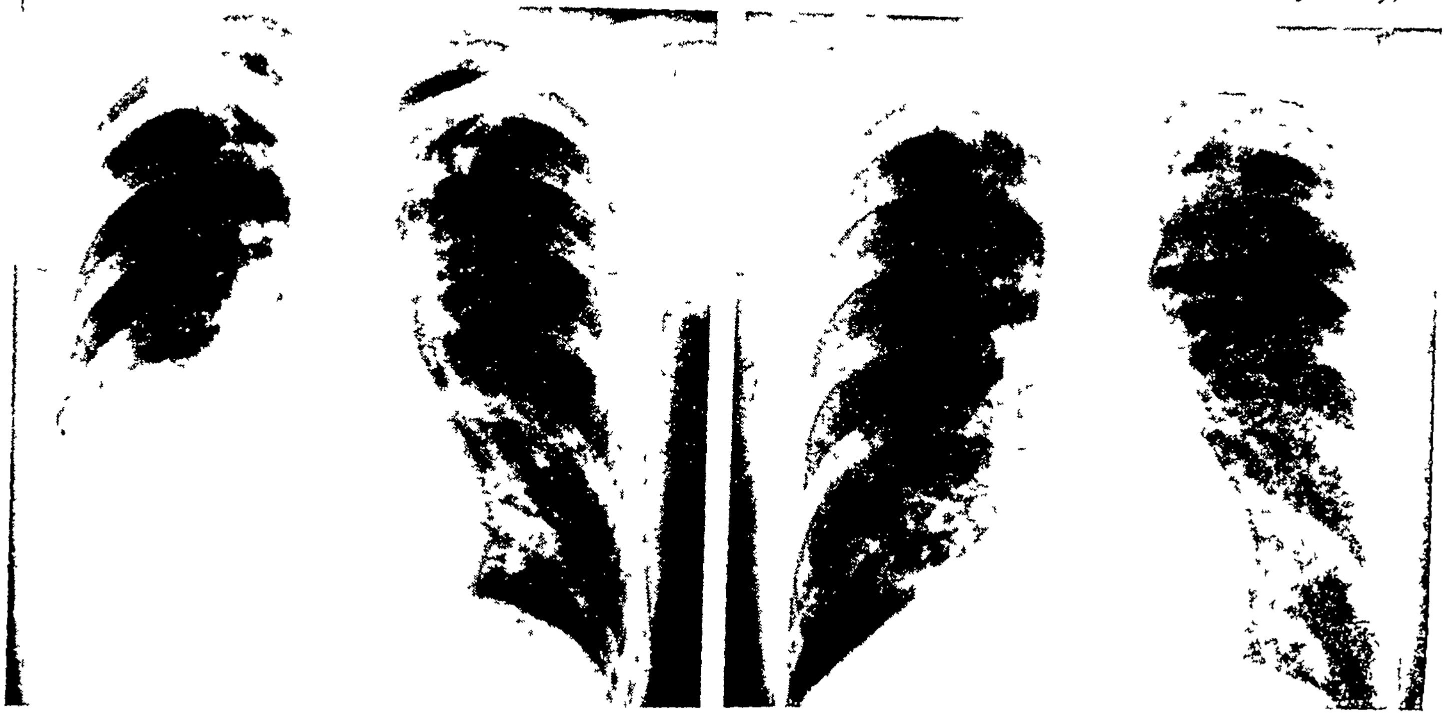

Fig 2 (case 2) —Drug effect on pulmonary metastases, chest roentgenogram taken Feb 25, 1959, prior to therapy

Case 4 (Patient 13) —A 31-year-old flier first noted a painless swelling of his right testis in April, 1959 On July 6, 1959, a right orchiectomy was performed The pathological diagnosis was teratocarcinoma A postoperative chest roentgenogram showed multiple large masses in both lungs, an intravenous pyelogram revealed a large rounded mass in the lower pole of the right kidney He was referred to Memorial Center for chemotherapy On admission, he complained of a pain in the left shoulder, cough, and dyspnea Physical examination revealed no evidence of abnormality elsewhere except for enlargement and sensitivity of both breasts Radiological examination confirmed the previous observations The urinary chorionic gonadotropin titers were 1,000,000 to 2,500,000 I U per 24 hours on multiple determinations The hemogram and renal and hepatic function tests were normal He was treated in the conventional manner previously described Urinary chorionic gonadotropin fell sharply starting in September and has been negative since on numerous determinations (Fig 3) Substantial evidence of tumor regression associated with complete alleviation of symptoms occurred in October, 1959 A chest roentgenogram made in January, 1960, revealed nearly complete disappearance of all pulmonary metastases previously observed His intravenous pyelogram was normal in November, 1959 The patient has resumed normal activity

Comment

Cancers arising from the germinal cells of the testis occur in about 1 in 50,000 men and represent less than 1% of all malignant neoplasms in males These tumors according to clinicopathologic classification and by order of frequency of occurrence, are seminoma, embryonal carcinoma, teratocarcinoma, adult teratoma, and choriocarcinoma Although some tumors are composed of one histological type, many tumors are mixtures of two to four elements Others which may at first appear to consist of only one certain element, are found after a diligent search of the specimen to contain others

Furthermore, no sharp dividing line can be drawn histologically between the classic choriocarcinoma and many embryonal carcinomas Pierce and others[7] reported two human embryonal carcinomas, heterografted to hamsters, with resultant evidence of production of chorionic gonadotropin Extragenital choriocarcinoma is extremely rare The absence of evidence of a primary in the testes from physical examination does not exclude the testes from being the original site Such was the case in patient 12, a small focus of choriocarcinoma was found in the left testis from postmortem examination

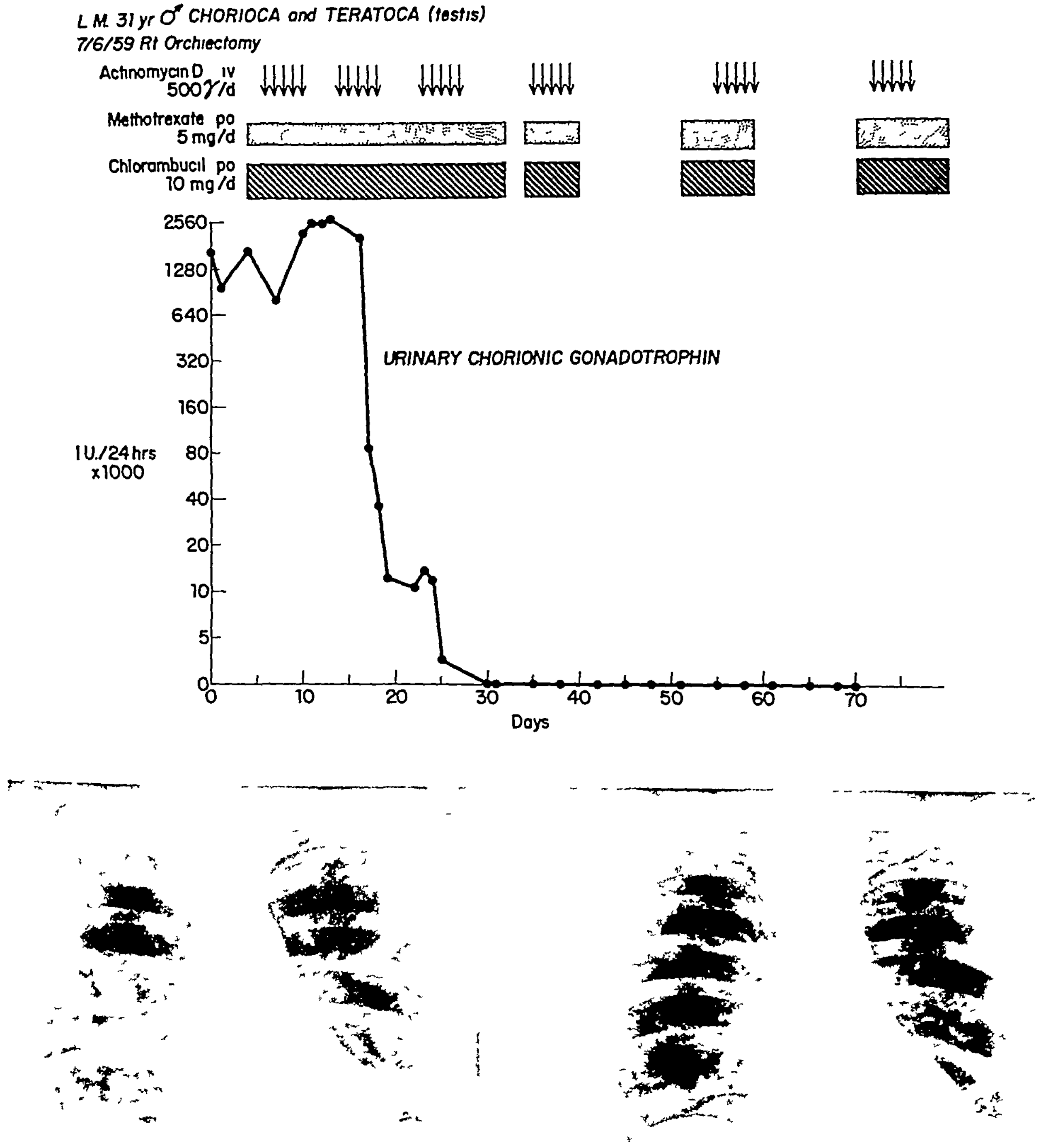

Fig 3 (case 4) —*Upper*, drug effect on urinary chorionic gonadotropin excretion *Lower*, drug effect on pulmonary metastases, chest roentgenogram taken Aug 13, 1959, prior to therapy

Seminomas are radiosensitive Patton and others[8] found that 90 to 95% of their patients with nonmetastatic seminoma survived five years or more following orchiectomy and radiation to the para-aortic lymph node regions Usually embryonal carcinoma and teratocarcinoma are radioresistant but radical orchiectomy followed by retroperitoneal lymphadenectomy offer a 30 to 40% five-year survival rate Choriocarcinomas have had a 100% mortality in two years, regardless of the type of therapy employed

In view of the poor response rate in testicular cancers other than seminoma, many forms of chemotherapy have been tried Recently Blokhin and co-workers[9] have observed tumor regression in patients with seminoma using sarcolysin, a phenylalanine mustard, but less encouraging results were obtained with other types of testicular tumors which are radioresistant Therapy with nitrofurazone (Furacin) has had a small number of clinical trials based on the observation that the drug causes damage to the germinal epithelium of testes in animals The reported effects were variable[10]

The difference in therapeutic response between testicular and uterine choriocarcinomas to amethopterin and 6-diazo-5-oxo-L-norleucine cannot be explained on the basis of difference of hormonal environment[3] Uterine choriocarcinoma is a fetal tumor that has been transferred to the maternal organism, testicular choriocarcinoma is a spontaneous tumor Antigen-antibody reactions may have been partly responsible for the regression of choriocarcinoma occurring in women It is hoped that means may be found to cause combined immunological and chemotherapeutic damage to testicular choriocarcinoma Freund[11] observed aspermatogenesis and tubular atrophy of the testes of guinea pigs, caused by specific antigerminal cell antibodies which were induced by inoculating the sperm or testicular suspensions of the same species We have vaccinated intracutaneously three male patients having metastatic choriocarcinoma with or without other elements using a human sperm pool mixed with Freund's adjuvant Two patients were shortly thereafter treated with, respectively, epoxypiperazine plus 6-diazo-5-oxo-L-norleucine plus 6-mercaptopurine plus 6-diazo-5-oxo-L-norleucine combinations but significant therapeutic benefit was not observed

The concept of combined drug therapy is not new Superior therapeutic effects are evident in the case of the drug combination therapy of pulmonary tuberculosis Combinations of antibiotics in the treatment of other bacterial infections have not been equally successful Although ample evidence has been accumulated that combinations of antimetabolites are more effective in the control of mouse leukemias and other transplanted solid tumors of animals[12a] than using a single drug alone, superior results have not been obtained in the treatment of acute leukemia in humans with combinations of folic acid and purine antagonists[12b] Synergistic effects have been observed in the treatment of neoplasms in animals by using one or more antimetabolites in conjunction with irradiation,[12c] but there has been no comparable statistical documentation in human neoplasms Recently actinomycin D has been reported as being capable of augmenting the action of radiation on normal skin and, in some instances, on neoplastic tissues[2] While the idea of inducing concurrent blockade to two or more metabolic pathways is biochemically sound, the failure to demonstrate its value in the management of clinical neoplasms may be due to inadequate experimental trials in patients The antimetabolites such as amethopterin, 6-mercaptopurine, 6 diazo 5-oxo-L-norleucine, the antitumor antibiotic actinomycin D, and the radiomimetic drugs nitrogen mustard and chlorambucil have been shown, respectively, to cause deleterious effects on embryonal tissues The above mentioned three classes of drugs have therefore been used in different combinations at their respective conventional dosages in an attempt to obtain a wide range of anti-embryoma activity In this series of 36 patients, 42 trials of drug combinations were used, 39 trials were considered to have been sufficient to permit evaluation of drug effects The data indicate that, of the various combinations tested, the best chance of deriving benefit accrued to those patients treated with the three classes of drugs in combination

Enhancement of drug toxicity is not unexpected when drugs are used in different combinations, at their full conventional dosages Drug toxicity as manifested by nausea, vomiting, weakness, stomatitis, diarrhea, leukopenia, thrombocytopenia, acneiform skin eruptions, and moderate loss of hair was extremely variable from patient to patient Those patients with chronic debilitation or evidence of renal, hepatic, and bone marrow dysfunction seemed most susceptible to drug toxicity Actinomycin D could possibly augment a pre-existing radiation reaction and could contribute to increasing pulmonary insufficiency, such was the case in patient 15 who rapidly died of respiratory failure with little evidence of metastatic disease in the lungs but with diffuse pulmonary fibrosis

Summary

Thirty-six patients with metastatic cancer of the testis were treated with different combinations of a nitrogen mustard (HN2), epoxypiperazine, chlorambucil, amethopterin, 6-diazo-5-oxo-L-norleucine (DON), 6-mercaptopurine (6 MP), and actinomycin D A total of 42 trials of drug combinations were made Some of the patients had received more than one combination of drugs, but each drug combination was studied and evaluated separately

Twenty-three patients were treated with an alkylating agent, an antimetabolite and actinomycin D combination Seven showed a complete or nearly complete resolution of pulmonary metastases and palpable masses or both, three of these have continued in good health for 9 months to 18 months or more, four had relapse of disease following a complete remission, one of which again responded favorably upon continued therapy Five of the 23 patients showed a partial regression of metastases and 4 of these died in spite of continued therapy

Nine patients were treated with an alkylating agent and actinomycin D One showed complete resolution of pulmonary metastases and has been in good health for over 12 months, one showed a partial and temporary regression of metastatic tumors Eight patients were treated with 6-mercaptopurine and 6 diazo-5-oxo-L-norleucine in combination one patient showed a sustained disappearance of the previously elevated urinary chorionic gonadotropin titers which was the only evidence of disease and he has been in good health for over 38 months

Of the total of 15 respondents, 10 had choriocarcinoma with or without embryonal and teratocarcinoma or both All of these were associated with a return to negative values, or to a significant fall, either temporarily or permanent, of previously elevated urinary chorionic gonadotropin titers The combination of chlorambucil, amethopterin, and actinomycin D was considered the most effective regimen This triple drug combination caused substantial but reversible toxicity on the hematological, gastrointestinal, and dermatological systems

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NEED FOR AUTOPSIES —And as for the footsteps of diseases and their devastations of the inward parts impostumations, exulcerations discontinuations, putrefactions, consumptions contractions extensions, convulsions, dislocations, obstructions, repletions, together with all preternatural substances, as stones, carnosities excrescences worms and the like, they ought to have been exactly observed by multitude of anatomies and the contribution of men s several experiences and carefully set down both historically according to the appearances and artificially with a reference to the diseases and symptoms which resulted from them, in case where the anatomy is of a defunct patient whereas now upon opening of bodies they are passed over slightly and in silence —F Bacon Advancement of Learning edited by W A Wright Oxford Clarendon Press

Medical Aspects of Safety in The Air

Jan H Tillisch M D, Rochester, Minn

THE REALIZATION that in the United States there are more than 350,000 certified pilots and that more than 53,000,000 revenue passengers are carried each year calls attention not only to the growth of aviation but also to the increased responsibility of the physician in this field These responsibilities for safety in aviation are twofold The first is to insure that the pilot, as well as other airmen, does not present any physical impairment that would interfere with the performance of his duties, and to insure that he does not have any physical or mental condition that suddenly may incapacitate him to a degree that he no longer could operate an aircraft with safety The second responsibility is to insure that the passenger will not undergo impairment of his health as a result of the changed environment coincident with air travel The physician also participates in the development of the technical equipment, such as supplementary oxygen, pressurization of aircraft cabins, and decelerative protective gear that aids in fulfilling these responsibilities

Historical Aspects

The history of medical participation in aviation goes back to World War I, when it was first realized that the selection of physically and mentally healthy pilots was essential for successful aviation From this original work have developed, with many modifications and refinements, the present physical standards for airmen The emphasis of such standards originally was on the vision and hearing of the pilot, in fact, so much importance was placed on these two attributes that it was necessary for a pilot to have supernormal vision and hearing With the accumulation of data and experience, it is now recognized that such stringent regulations are not necessary, although airmen must have adequate vision and hearing As aircraft improved in performance, enabling planes to go to higher altitudes the problems of hypoxia and dysbarism became prominent To endure the environmental changes coincident with decreased atmospheric pressure, the pilot must have a normal cardiac and respiratory system, and thus greater emphasis was placed on that aspect of the examination Finally, the advent of the current high-performance aircraft made it even more vital that airmen have no condition that might interfere even momentarily with their physical performance or mentation Unfortunately, it is not true that after solving all these problems we can sit back and relax for the present planning of passenger aircraft calls for planes capable of speeds of Mach 2 6 to 3 and altitudes of 60,000 to 80,000 ft

> This responsibility for medical safety is twofold One is to insure that operators of aircraft have no condition that will interfere with operating an aircraft or will suddenly and unexpectedly incapacitate the person The second is the selection of all persons who may be transported by air without harmful effects The general physical standards for pilots, and specifically the standards of the Federal Aviation Agency are valuable aids in determining the medical safety of an individual's operating an aircraft

The history of air transportation of ill passengers is more recent Other than the occasional air transportation of a seriously ill patient there was no large-scale movement of the sick by air until the Spanish Civil War, when the Germans transported by air large numbers of their sick and wounded from Spain back to their country At this time, airlines and other commercial air carriers also became interested in this problem, because they were carrying an increasing number of sick people Coincident with this, aircraft were developed that were capable of altitudes that increased the environmental stresses of flying At this time certain criteria were established to determine which patient might be transported safely by air In retrospect, it appears that some of the criteria adopted were too strict or were founded on supposed facts that since have been disproved

Environmental Changes in Air Travel

Before the specific responsibilities of the physician in aviation safety are discussed, the environ

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From the Mayo Clinic and Mayo Foundation The Mayo Foundation is a part of the Graduate School of the University of Minnesota

Read before the Section of Preventive Medicine at the 109th annual meeting of the American Medical Association Miami Beach Fla June 13 to 17 1960 mental changes met with in air travel should be reviewed briefly From the pilot's standpoint, the fact that he must control an object traveling at increasingly high speeds, being capable of movement in three directions, and traversing an area that is becoming increasingly crowded with similar objects is of great importance For the passenger, the fact that he is traveling in an object capable of movements that may produce motion sickness can be of importance For both the aircrew and the passenger, the decreased atmospheric pressure encountered with increasing altitudes may cause physiological changes that can be harmful if not ameliorated In brief, these changes are the hypoxia resulting from decreased partial pressure of oxygen and the expansion of gases in the body

Passengers—In modern-day passenger aircraft, with the cabin pressurized to 6,000 to 8,000 ft (2,000 to 3,000 ft in jet planes) and with supplemental oxygen available, the physiological stresses of increased altitude fortunately are kept at a minimum Larger planes and improved flying aids such as radar have made flying much smoother, with a resultant decrease in motion sickness in passengers With pressurized cabins and supplemental oxygen, a patient who is able to care for himself, who is not objectionable to his fellow passengers, and whose condition is stable enough not to require emergency care during the flight may be flown with safety to himself and others In emergency cases, the patient frequently is transported in nonpressurized aircraft, such as commercial ambulance planes If oxygen is available and if the altitude is held down to reasonable limits of 6,000 to 8,000 ft, the patient can be transported safely by such planes unless he is suffering from severe cardiac or respiratory disease

Crew—With regard to the operating crew of an aircraft, be it a single pilot, or pilot, copilot, and engineer, modern day aircraft present increased problems The speed of modern high-performance planes makes it mandatory that all members of the aircrew constantly be physically and mentally capable of operating the aircraft Although high-performance planes are thought of as affecting only military and commercial-airline crews, this is not true The private pilot flying a slower piston aircraft in the vicinity of high-performance planes is subject to the dangers of the high speed of the other aircraft The tremendous increase in air traffic also makes it essential that all pilots be in such physical condition as to be constantly on the alert This means that the physician examining a pilot for official governmental licensing purposes, an airline examination, or a private examination must ask himself whether this man can fly with safety—safety for himself, as well as for others

Standards for Pilots

The physical standards as promulgated by the Federal Aviation Agency are guidelines to insure medical safety in the air, and physicians should have a general knowledge of them These regulations have been reviewed and revised by the Flight Safety Foundation and the Committee on Aviation Medicine of the American Medical Association

Visual and Auditory Acuity—These standards require visual acuity in either or both eyes of not less than 20/50 and brought up to 20/20 in each such eye by glasses (20/30 for third-class airmen), with the absence of serious conditions that may interfere with normal visual function They require hearing the whispered voice at 8 ft with each ear separately, or a hearing acuity of at least 50 per cent of normal throughout the effective range of speech and radio as demonstrated by audiometer

Diabetes Mellitus—An established medical history or clinical diagnosis of diabetes mellitus that requires treatment with insulin or other hypoglycemic drugs is disqualifying This regulation grounds the airman who is receiving insulin, and it appears to be a justified precaution in view of the possibility of hypoglycemia with impairment in the performance of the pilot and even unconsciousness In light of current knowledge concerning orally given hypoglycemic drugs, the regulation also is justified At present, the use of tolbutamide (Orinase) is accompanied by an extremely low incidence of side-effects Severe hypoglycemia has been noted infrequently in persons taking chlorpropamide (Diabinese) These hypoglycemic reactions have been more protracted than those usually seen after administration of exogenous insulin The fact that the regulation permits a person to be physically qualified as a pilot if he has diabetes mellitus not requiring hypoglycemic drug therapy generally meets the requirements of safety in the air Such milder, or maturity-onset, forms of diabetes mellitus most frequently occur in middle age, after the pilot has had his training and at a time when it would be difficult for him to change occupations Because of the natural mildness of the disease in such persons, it does not pose an undue risk However, it must be realized that the so-called degenerative complications of impaired carbohydrate metabolism may develop in persons who have mild diabetes Therefore, close observation of such persons for diabetic retinopathy and premature peripheral and coronary arteriosclerosis is necessary The pilot who has diabetes mellitus not requiring treatment with hypoglycemic drugs should be observed to insure that he is on an adequate diet

Circulatory Disorders—The Federal Aviation Agency regulations state that an established medical history or clinical diagnosis of myocardial infarction or angina pectoris, or the presence of other evidence of coronary heart disease that the Civil Air Surgeon finds may reasonably be expected to lead to infarction, shall be disqualifying

Myocardial Infarction The diagnosis of myocardial infarction generally can be substantiated not only by the history and physical examination but also by laboratory aids, especially electrocardiography. Because physicians cannot factually determine at present which person is likely to have a recurrence of myocardial infarction or permanent damage to the heart, the generalization must be made that all persons suffering from myocardial infarction should not operate a plane. It is not only the possible sudden unexpected death of a pilot that makes this regulation necessary. The person suffering from myocardial infarction frequently is greatly disturbed at the time of the attack, with impairment of both his physical and mental performance. Also, the effect on other members of the crew of one of their members suddenly becoming incapacitated or even dying will interfere with proper operation of the aircraft. The examining physician also must keep in mind that myocardial infarction considered as mild on the ground may be fatal in the air.

Angina Pectoris.—The second portion of the regulation concerning heart disease presents problems. The diagnosis of angina pectoris frequently is most difficult. The use of exercise tests and determination of blood fats may be of some value in this problem. Other related conditions, such as hypertension, may be helpful in the diagnosis. A further problem is added in that the regulation states as follows: "... angina pectoris or other evidence of coronary artery disease which the Civil Air Surgeon finds may reasonably be expected to lead to myocardial infarction." The two important phrases in this regulation are, "which the Civil Air Surgeon finds" and "may reasonably be expected." In other words, the examiner or private physician is not expected to make the final decision but to pass on the information to the Civil Air Surgeon if there is evidence to support the diagnosis of coronary heart disease.

Other Circulatory Disturbances.—The regulations concerning blood pressure are those generally accepted by the medical profession. It should be emphasized that the regulation also states that the cardiac and renal status must be shown to be normal.

The requirement that applicants who are 40 years of age or more shall demonstrate a degree of circulatory efficiency compatible with the safe operation of aircraft at high altitudes can encompass a number of conditions. In this group should be mentioned recurrent attacks of focal cerebral ischemia. While these conditions need not necessarily cause unconsciousness, they often are accompanied by transitory mental confusion and motor impairment. The diagnosis is important because these manifestations may herald a severe infarction.

Nervous and Mental Disorders.—The regulations further state that an established medical history or clinical diagnosis of the following conditions shall be disqualifying: (1) a character or behavior disorder that is sufficiently severe to have repeatedly manifested itself by overt acts, (2) a psychotic disorder, (3) chronic alcoholism, (4) drug addiction, (5) epilepsy, and (6) a disturbance of consciousness without satisfactory medical explanation of the cause. The entity of "character or behavior disorder manifesting itself by overt acts" would encompass sexual deviates, pathological liars, and antisocial, irresponsible persons. While it has been accepted that the psychotic person should not fly a plane, some question has been raised about forbidding such a person to fly when he has received treatment and apparently is cured. It is the consensus of psychiatrists that the possibility of recurrence of the psychosis and the inability to determine when such a recurrence might appear make it advisable that such persons be grounded permanently. This is done as an added safety factor, and it is in no way meant to impugn the possibility of cure or to stigmatize the victim of the disease. The reasons for not permitting chronic alcoholics or drug addicts to fly a plane are obvious, the impaired judgment and the possibility of loss of consciousness make the risk too great. The person who has epilepsy or any other idiopathic convulsive disorder is always subject to possible loss of consciousness despite treatment with anticonvulsive medicaments and, therefore, should not be allowed to operate an aircraft. Grounding a person because of a disturbance of consciousness without satisfactory medical explanation of the cause appears to be a logical ruling. However, with increased experience and more detailed medical histories of airmen, it is generally believed that a single unexplained syncopal attack should not prevent a person from flying. An applicant shall be disqualified if he has any other disease of the nervous system, mental abnormality, or psychiatric disorder that renders him unable to perform safely his duties as an airman.

Need for Individual Judgment

These regulations, with minor differences, are similar to those for airmen in other countries and to those of the International Civil Aviation Organization. What differences do exist indicate that the regulations of other countries are more strict. It is apparent, as must be true of any medical regulatory standard, that some standards brook no debate and others allow considerable latitude in judgment regarding a person's ability to fly a plane. An example of the former is the ruling that a person with a diagnosis of myocardial infarction is disqualified; an example of the latter is the ruling that an applicant is disqualified if he has any other organic, functional, or structural disease that renders him unable to perform safely his duties as an airman. Conditions that might come under this second ruling depend on the skill and judgment of the examining physician. An example is the person who has a malignant tumor. Before arriving at a de cision the examiner should determine if the malignant process is so widespread as to weaken the person and to prevent safe operation of the aircraft, or if it is of such a degree or location as suddenly and unexpectedly to incapacitate the person It is obvious that such a decision must be made on an individual basis This type of reasoning can be applied to other pathological processes in which the question of degree of interference with proper operation of the aircraft and the likelihood of sudden incapacitation are the deciding factors

Another problem that arises in the examination of airmen is the pilot applicant who does not have previous flying experience This person frequently must be protected in that he may be able to meet the required physical standards at the time of examination but may present findings that foretell the later development of a disqualifying lesion The applicant who has a hyperreactive blood pressure or latent diabetes falls in this category Such persons should be informed of the possibility of disqualification later, before they decide to expend considerable time and money in preparation for a flying career, either as a hobby or as a means of livelihood

The Physician and the Pilot-Patient

In this general review of the physician's responsibility in safety in flight and the role of the Federal Aviation Agency's regulations in helping to meet these responsibilities, it should be pointed out that a change in the physician's fundamental philosophy may be necessary The physician rightly places the well-being of his patient foremost However, the physician also has other responsibilities, among them his responsibility to the public This dual role is well represented by the patient with a contagious disease about whom the physician must inform the proper governmental authorities to insure against further spread of the disease The same reasoning should be applied to the pilot who has a disabling, or potentially disabling, condition This applies not only to the pilot operating planes transporting passengers but also to the private pilot for, in either case, more than the pilot's life may be sacrificed by collisions between planes and crashes in populated areas

It is accepted that the physician examining a person as the designated agent of the Federal Aviation Agency will present all his findings to that agency The relationship between the physician and the private patient who happens to be a pilot raises an ethical question The private physician, knowing that the pilot-patient has a condition that may be dangerous to himself or others, must decide whether to keep such findings in confidence The best solution to the problem is for the physician to discuss his findings frankly with the pilot-patient, advising him of the dangers of operating an aircraft in his condition If the pilot-patient does not accept this legally nonauthoritative advice, a difficult situation arises that must be settled on an ethical basis The Hippocratic oath states, 'Whatever in connection with my professional practice or not in connection with it, I see or hear in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret' The phrase which ought not to be spoken" implies that there are things which should be spoken of when, by doing so, the health of the patient and the public can be benefited Furthermore, the 'Principles of Medical Ethics of the American Medical Association" states as follows 'A physician may not reveal the confidences entrusted to him in the course of medical attendance, or the deficiencies he may observe in the character of patients, unless he is required to do so by law or unless it becomes necessary in order to protect the welfare of the individual or of the community These principles also state, The honored ideals of the medical profession imply that the responsibilities of the physician extend not only to the individual, but also to society where these responsibilities deserve his interest and participation in activities which have the purpose of improving both the health and the well-being of the individual and the community"

Therefore, it appears that a physician who discovers a medical defect in a member of an aircrew that may endanger the crewman or the public, ethically may reveal such information to the proper authorities The final decision is the judgment of the attending physician

Summary

The large number of persons operating aircraft and being transported by air emphasizes the responsibility of the medical profession in the safety of these persons This responsibility is to make certain that the operators of aircraft have no medical condition that will interfere with the proper performance of their duties or that will suddenly and unexpectedly incapacitate the person

A further responsibility is to be able to select those patients who may be transported by air without harmful effects The modern-day aircraft, with pressurization and supplemental oxygen, has greatly increased the margin of safety for the air transportation of the ill passenger

The problem of a pilot who has a defect disqualifying him for flying that is discovered by a private physician can best be resolved by a frank discussion with the pilot-patient, pointing out the dangers to himself and others If this does not resolve the question, the possibility of informing the responsible authorities is considered The final decision in this matter must rest with the physician

Urine Radiography of Excreted Iodide

A New Renal Function Test

Burton P Grant, M D, and Russell Wigh, M D, Augusta, Ga

Excretory urine radiography is a technique which measures quantitatively the amount of organic iodine contained in a urine sample collected after the intravenous injection of a contrast medium It can be employed as an adjunct to intravenous pyelography The procedure simply requires inspection of a roentgenogram of urine voided 30 minutes after the injection of 30 cc of a renal contrast agent The shadow of the specimen is compared with that of a standard with respect to film density The standard consists of an x-ray exposure of an aluminum stepladder wedge so machined that its film densities fall within the anticipated density range of excreted iodine in the urine The validity of this method has been established by comparing the results with those obtained by two other methods of measuring the urinary excretion of iodine

SINCE THE introduction of intravenous pyelography by Osborne and associates[1] in 1923, efforts have been made to use the procedure not only for anatomic study but also to estimate renal function A radiologic estimate of the amount of contrast medium that is being eliminated by the kidneys during pyelographic study is made difficult by anatomic variations in size or volume of the urinary collecting system, as well as by changes in motor activity and by obstructing lesions

Organic iodide excretion as a measure of renal function was established by Findley and associates[2] in 1942, when they compared iodopyracet (Diodrast) excretion with urea clearance values in the same patients The amount of iodopyracet administered was that usually employed for pyelography The chemical measurement of iodide excreted in the urine compared favorably with urea clearance values and was considered by Findley to be superior to the latter study in many respects The difficulty of chemical analysis has prevented clinical adaptation of this procedure In an effort to place urine iodide analysis on a clinically accessible plane, we began to use a roentgenographic method of measurement in 1958

Procedure

Excretory urine radiography is a technique which measures the amount of organic iodide contained in a urine sample obtained after the intravenous injection of a roentgenographic contrast medium and permits accurate quantitative estimates of renal function The procedure simply requires comparison of radiographic film densities The x-ray exposure of that amount of organic iodide excreted by the kidneys during the first 30 minutes after the intravenous injection of 30 cc of sodium diatrizoate (Hypaque) into an adult is compared with a standard (Fig 1).

The reference standard is a stepladder type aluminum wedge, the x-ray transmission densities of which have been calibrated in terms of the densities of known amounts of diatrizoate The value of each individual step in the wedge standard is expressed as a percentage of the adult dose (Fig 2) These amounts were so selected that the unknown quantity of contrast agent contained in the patient's urine would fall between the selected inclusive range of standard values when the x-ray film densities were compared When calibrating the wedge standard, water was added to cups containing known amounts of the contrast agent until the fluid heights in each container were equal, the differences in radiographic density then reflected only the differences in the amount of contrast medium contained in each

Our present wedge standard (Fig 1, *top*) is 24 cm long, ranging in height from 7 to 17 mm, it has 8 steps Each step differs by about 1 mm in height, such differences produce a satisfactory standard

Six-ounce waxed-paper cups (Lily, tall, No 67) are used as the specimen containers, since this type

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From the Department of Radiology, Medical College of Georgia

Read before the 8th Annual Meeting of the Association of University Radiologists, Dallas, Texas, May 7-8, 1960 of receptacle does not appreciably add to the density of the material within it Tests of glass containers had shown too much variation in density Exposures at a 40-in distance, with 55 kv and 10 ma produce films with densities which can be evaluated easily when the total volume of urine and water is 125 cc One or more specimens can be placed near the aluminum standard on an x-ray film cassette containing par-speed screens and film (Fig 1, *top*) Film development time is that conventionally used in most x-ray departments

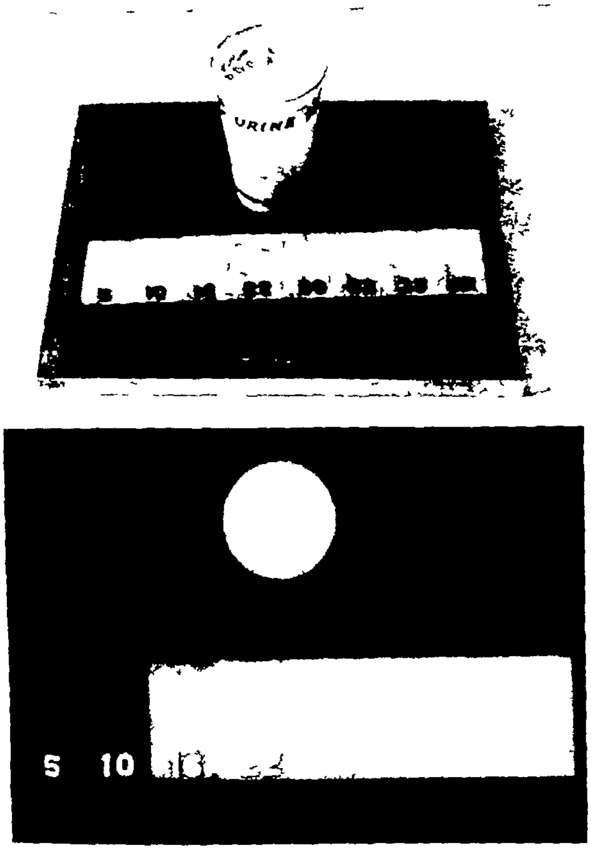

Fig 1 —*Top*, voided urine, containing unknown quantity of diatrizoate, placed on cassette beside calibrated aluminum standard *Bottom*, quantity of diatrizoate in urine can be determined by comparison of film densities

Initially, comparison of the unknown density with the densities of the wedge standard were made visually as well as with a densitometer Visual comparisons correlate so closely with photoelectric comparisons that the latter procedure is not needed Interpolation is necessary when the density of the unknown falls between adjacent densities of the standard

The number of steps in the aluminum wedge can be machined as desired, for clinical purposes, steps expressing differences of about 5% in the amount of injected contrast medium are ample A satisfactory range for the standard expressed as a fraction of the injected iodide will be from 5 to 45%

The 30-minute urine sample was chosen because it coincides with our practice of obtaining a 30-minute postmicturition erect film during pyelographic study This film obtained immediately after voiding is of great aid in establishing bladder residual after micturition When excretory urine radiography is coupled with intravenous *cystography*, one knows whether all of the urine was voided One can modify the interpretation of the measurement accordingly It should be noted that this knowledge about the amount of residual urine is not available in other renal function studies based on total excreted urine, unless catheterization is also employed

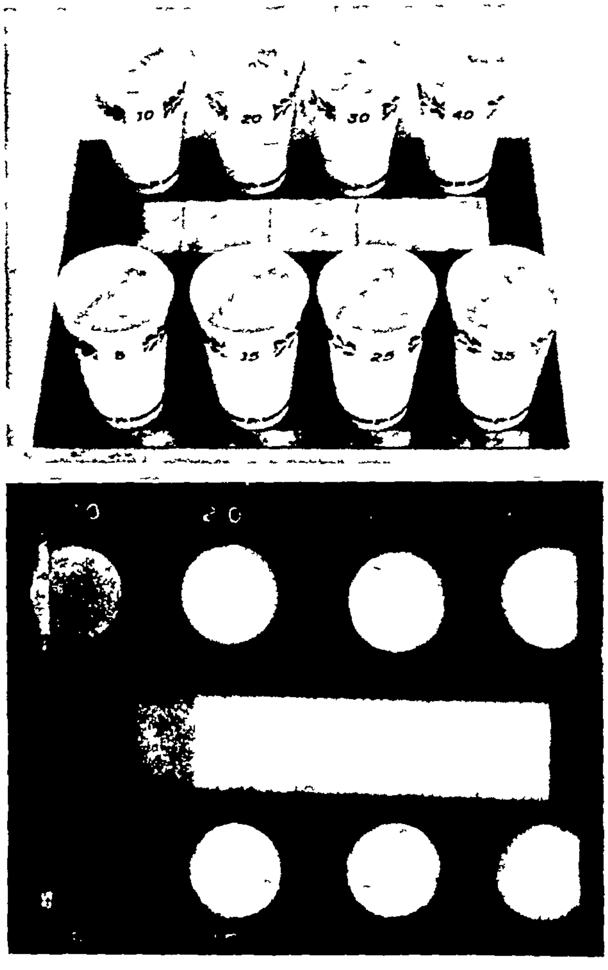

Fig 2 —*Top*, aluminum standard was calibrated by surrounding it with solutions of known amounts of agent expressed as per cent of usual adult dose of 30 cc of 50% diatrizoate *Bottom*, film densities of aluminum standard were compared with those of diatrizoate solution

Determination of Accuracy

The accuracy of urine radiography as a measure of the contrast medium contained in the 30-minute specimen was established by two different methods chemical analysis of excreted iodide and radioactive diatrizoate excretion values

The urines of 10 patients with varying degrees of renal function were examined chemically Thirty minutes after the injection of 30 cc of 50% diatrizoate, voided urine specimens were obtained and measured by the method of urine radiography These same urine specimens were then analyzed chemically for organic iodide content The methods compare favorably in all ranges with but minor variations (Fig 3)

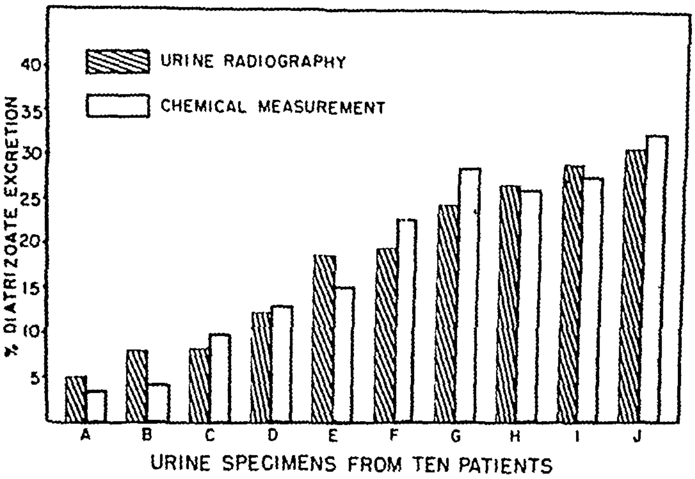

Fig 3 —Diatrizoate excretion, measured radiographically and chemically in 10 different patients Graph illustrates close correlation

Another 10 patients were studied by means of diatrizoate tagged with radioactive I^{131} The radioactivity of the contrast medium prior to its injection was determined with a scintillation counter The number of counts was compared with that present in the 30-minute voided urine specimen Since the chemical is excreted unchanged in the urine, the activity of the urine specimen reflects the concentration of I^{131}-tagged material The concentration of opaque medium in each of these 10 specimens was measured by the radiographic procedure Figure 4 illustrates the close correlation obtained by these two independent methods

The considered reliability of chemical and isotopic determinations of the quantity of urographic contrast medium reflects the accuracy of urine radiography

Comment

This new technique for measuring organic iodide concentration in the urine is carried out with a minimum of expense and effort, and results are rapidly obtained The collection of the urine and exposure and development of the radiograph are readily carried out by x-ray technical personnel Except for the aluminum stepladder wedge, no additional equipment is needed The wedge can be constructed by a machinist at a nominal cost

Care must be exercised in collection and handling of urine if the results are to be meaningful Urine lost, either by the patient or by the technician, will of course produce an error in the result It is obvious that the degree of accuracy of any function test based on analysis of voided urine is proportionate to the percentage of bladder urine voided and collected at the specified time

Various methods of visual comparison of the differing densities have been tried One can approximate the value of the unknown with fair accuracy (within 5%) by masking all but one of the standard values and viewing it individually with the unknown This method was found to be satisfactory within this given range when tested by 15 observers

A more reproducable and accurate comparison can be made by cutting the film, so that the section bearing the radiograph of the specimen can be moved along the standard scale until it is matched with one of its steps (Fig 5) This is aided by again masking the viewing area (Fig 6) Although this method is satisfactory in an x-ray department film viewing area, were the interpretation to be done routinely in a clinical laboratory, a small illuminating system could be easily designed

The mechanisms of excretion of the various iodinated renal contrast mediums differ Iodopyracet in low concentration is excreted almost entirely by the renal tubules However, with the blood concentration employed for pyelography, a large portion is excreted in the glomerular filtrate Similarly, sodium acetrizoate (Urokon) has been found to be excreted chiefly by glomerular filtration [3] The work of McChesney and Hoppe [4] indicates that the mode of excretion of diatrizoate differs from that of other contrast mediums, and that it is excreted entirely by glomerular filtration and, therefore, measures this renal function purely

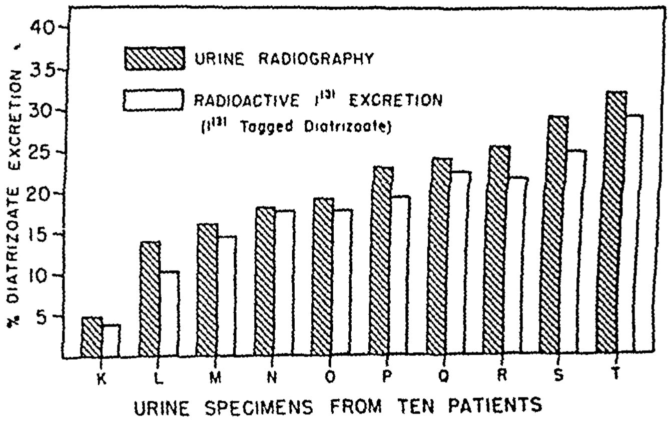

Fig 4 —Diatrizoate excretion, measured radiographically and isotopically in 10 other patients Graph indicates accuracy of urine radiography

A study of the charts of 50 patients who have had kidney function tests, including blood urea-nitrogen levels, phenolsulfonphthalein excretion rates, creatinine clearance values, the Howard test, and concentration tests indicates that often there is wide variation, and even conflict, between the re sults of these accepted tests in a given patient A comparison, therefore, between iodide excretion rates as determined by urine radiography and these other renal studies was not easily made in these same patients One would expect diatrizoate excretion to be comparable to the results of other tests of glomerular filtration, such as creatinine clearance in general, this is true Results of less sensitive tests such as blood urea-nitrogen determinations, are frequently at variance with diatrizoate excretion rates There seems to be fair correlation with phenolsulfonphthalein tests At times, though, there are striking differences Most are probably due to unvoided phthalein dye contained in the residual bladder urine

We think that this method urine radiography, is accurate and is a very good renal function test Thus, on the basis of our experience to date, we can suggest that urine radiography values of 30% or more of excreted diatrizoate in 30 minutes indicate excellent renal function, that values between 20 and 30% fall in the average range and 10 to 20% in the reduced range, and that values below 10% are indicative of poor renal function

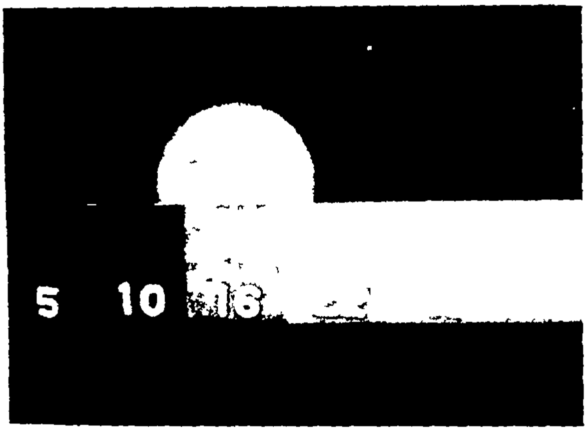

Fig 5 —Urine radiograph was cut, and that portion bearing urine sample was moved along aluminum scale section for more ready comparison

Urine radiography may be employed either as a separate renal function test or as a part of excretory pyelography Further modifications and adaptations to be investigated include reduction in the injected volume of the drug when the test is purely for biochemical information, fractional determination, as in the phenolsulfonphthalein test, and differential renal excretion rates by individual ureteral sampling to evaluate unilateral kidney disease

Summary

A new technique, excretory urine radiography, for estimating organic iodide excretion after its intravenous injection is simple and inexpensive, its accuracy has been proved by comparison with chemical and isotopic measurements of iodide excretion It facilitates measurement of glomerular filtration It adds to excretory urography an important needed feature or may be employed as a separate renal function test The range of normal values is provisionally considered as those above 20% excretion of diatrizoate in 30 minutes

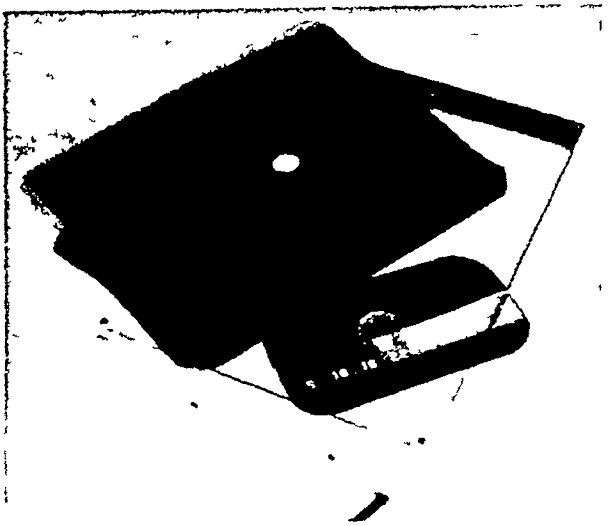

Fig 6 —Simple method of masking light After sections of single urine radiographic film are separated, they can be individually moved over small light source for more accurate comparison

Medical College of Georgia (Dr Wigh)

The authors wish to thank Mr Irwin S Shupe Director Chemical Control Laboratories of the Winthrop Laboratories for the quantitative chemical analysis of the iodide within the urine samples

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REMOTE ANCESTOR OF THE MICROSCOPE?—Every object much exceeds its natural size when seen through water Letters, however small and dim, are comparatively large and distinct when seen through a glass globe filled with water —J Clarke, *Physical Science in the Time of Nero, Being a Translation of the Quaestiones Naturales of Seneca (B C 4 65 A D)* Macmillan London, 1910, p 29

COUNCIL ON FOODS AND NUTRITION

Antibiotics as Food Preservatives

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In 1943, Tarr and associates[1] began to explore the use of various antibiotics for the preservation of fish. They found two tetracyclines, chlortetracycline and oxytetracycline, especially effective. In 1945, Curran and Evans[2] reported that penicillin had a sporicidal effect on a number of bacteria, including Bacillus stearothermophilus, one of the causes of "flat-sour" spoilage in canned vegetables. Recently, the United States Food and Drug Administration[3] approved the use of chlortetracycline and oxytetracycline on eviscerated poultry. Canadian authorities[4] sanctioned the use of these antibiotics on both poultry and fish. Since these decisions, many firms have been considering commercial application for antibiotics in the handling and distribution of their products.

Antibiotics as Acceptable Food Preservatives

Antibiotics are not yet universally accepted as preservatives. An acceptable food preservative should not create a hazard to public health or conceal inferiority in a product. It should significantly increase retention of quality during harvesting, processing, storage, and distribution and be low enough in cost to make its use commercially profitable.

While antibiotic preservatives meet some of these criteria, various difficulties may be encountered. Health hazards involved in the use of antibiotics in foods are a constant danger, particularly with compounds also used in the therapy of human illness. Officials in North America prefer, at least with regard to the tetracyclines, that little or no antibiotic residue be left in the food at the time of consumption. This standard has been achieved in poultry and fish because only small amounts of antibiotic are permitted and because chlortetracycline and oxytetracycline are instable in the tissues, especially during cooking, where the residual antibiotics are decomposed.[5]

Antibiotics are not likely to conceal inferiority in a food, and it has been assumed that they have no adverse effects on its nutritive value. They may supplement good sanitation and refrigeration practices but cannot replace them. Furthermore, poultry moved in interstate commerce is processed under continuous inspection by the United States Department of Agriculture. This insures sanitary handling of the product and removal of unwholesome carcasses. About 80% of the birds killed in the United States are subjected to such inspection. In some states birds destined for local consumption also are inspected.

Certain antibiotics under specified conditions significantly increase quality retention of products in storage, but whether or not commercial use is economically advantageous is still unknown. Effects on poultry and fish are currently under investigation.

Antibiotics in Specific Foods

Poultry.—In commercial use, a food-grade antibiotic is added (10-20 ppm) to the ice-slush used for chilling eviscerated, washed poultry carcasses. The poultry usually remains in the slush for at least one to two hours, then is drained and packaged for shipment to retail outlets.

In numerous laboratory reports and semicommercial trials, antibiotic treatment doubled market life of the product (up to three weeks at 40-45 F). No one, however, has been able to demonstrate such outstanding benefits in commercial operations, although birds treated with permissible antibiotics have slightly longer market life.[6] One reason for lowered efficiency may be the development of resistant strains of bacteria, a situation which occurred in at least one commercial processing plant[7] and, also, has been demonstrated in vitro.[8]

Fish.—Successful laboratory trials have been made with chlortetracycline and oxytetracycline in preservative "dips" for fish fillets, in refrigerated brines for holding eviscerated whole fish on shipboard, and in ice used to refrigerate the fish during transport, processing, and marketing. With refrigerated tem-

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The Council has authorized publication of the above report
PHILIP L WHITE, Sc D, *Secretary*

From the Department of Food Science and Technology, University of California peratures, storage life has been extended from one to three weeks[1] However, no data on commercial use of antibiotics have been published, and it is not known if resistant forms of spoilage bacteria develop under commercial application

Beef, Lamb, and Pork—The use of antibiotics for enhancing market life of 'red meats, especially of beef, has been tested extensively Chlortetracycline and oxytetracycline were effective in laboratory trials particularly with chilled products, such as dressed carcasses, cuts, and ground meat A few commercial trials have been made in foreign countries,[9] but none have been reported in the United States

Canned Goods—Early trials with the antibiotic subtilin were encouraging and raised the hope that, with antibiotics, the heat treatment required to guarantee a safe canned product could be greatly reduced (Heat causes poor flavor and texture in a number of canned foods, especially in certain meat items and vegetables containing little acid) However, later work has shown that there is little hope of improving the process with antibiotics presently available[10]

Fresh Fruits and Vegetables—Antibiotics may be of value in retaining quality in fresh fruits and vegetables, which have a notoriously poor shelf life In a few laboratory trials, streptomycin, chlortetracycline, and oxytetracycline gave promise of extending the market shelf life of fresh vegetables such as spinach, lettuce, radishes, and salad greens[11] No commercial trials have been reported

Milk—Some of the earliest reports on antibiotics as a preservative concerned milk However, research results have been disappointing[12]

Baked Goods—Cream- and custard-filled items are a constant problem in marketing bakery products Infections in these products, caused by the growth of salmonellae, or Staphylococcus aureus, and the resultant toxin, are a threat to public health Under laboratory conditions, combinations of subtilin and chlortetracycline or oxytetracycline controlled growth of these organisms in baked goods[10] However, commercial benefits are not known

Current Problems and Future Outlook

Under proper conditions, certain antibiotics are desirable, useful additives for extending the market life of some foods However, problems and limitations in the use of these compounds need to be recognized and dealt with intelligently

First, antibiotics are not ideal preservatives, any more than, for example, the benzoates, sulfur dioxide, or sorbic acid and its salts Even the most successful ones, the tetracyclines, have limitations Although they are effective against bacteria, they do not guard against yeasts or molds Furthermore, they can control only some food-spoilage bacteria Clearly, the proper antibiotic or combination of antibiotics must be determined for each intended use Possibilities for combinations of two or more antibiotics or of antibiotics and other chemical preservatives (for example, the sorbates) should be explored further for specific applications

Second, development of resistant forms of organisms under intended conditions of use presents a serious problem Perhaps special antibiotics for food preservation, particularly for animal products, are needed These antibiotics would be used only for preservation and not for therapeutic uses in man or for growth-stimulation purposes in animals Terminal' rather than "in-process antibiotic treatments might be devised so that opportunity for in-plant development of resistant spoilage organisms would be minimized

More work needs to be done on the public health aspects of using antibiotics in foods Acute and chronic toxicity tests for new antibiotics are accepted musts' The practice of limiting certain antibiotics to use in food preservation might help to prevent the build-up of sensitivity to antibiotics in human beings and the development of antibiotic-resistant organisms which cause human disorders

Summary

Since 1943 antibiotics have been explored for use in preservation of poultry, fish, chilled 'red' meats, canned vegetables, fresh vegetables, milk, and baked goods

Promising results with chlortetracycline and oxytetracycline have led to permission for their commercial use with fish and poultry in Canada and with poultry in the United States However, commercial control of spoilage bacteria resistant to the tetracyclines is a serious problem

Further research is needed in several areas Perhaps two or more antibiotics can be used at the same time or with a chemical preservative Consideration also should be given to "terminal' rather than in-process' application of antibiotics and to development of antibiotics for specific use in food preservation The latter would not be used with humans or animals, either to control diseases or to influence nutritional responses

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Radiation Preservation of Foods

H E Robinson, Ph D, and W M Urbain, Ph D, Chicago

Many advanced methods of preserving foods have been developed, but all have limitations With the possible exception of freezing and refrigeration, most processes limit the usefulness of a food or alter its characteristics undesirably Hence, food research workers constantly seek new and improved preservation methods In recent years, the use of radiation has shown great promise[1-4]

Processing

In radiation preservation gamma rays or electron beams destroy the spoilage micro-organisms Both have similar effects although they differ in the manner in which they penetrate the food and are absorbed In all cases, except where the energy level of the rays is extremely high, the energy is dissipated as harmless heat

Gamma rays are derived from radioactive materials, such as Co^{60}, which in their decay emit gamma radiation Such materials are produced in large quantities in atomic reactors either as fission products or by irradiation with neutrons of substances such as Co^{60} Electron beams, on the other hand, are best secured from man-made electron generators which involve a source of electrons, such as a hot wire These generators accelerate electrons by high voltages (usually a million volts or more)

In the treating of food with electron beams, every portion of the food must be penetrated with sufficient radiation to kill all spoilage micro-organisms The amount of radiation differs with each organism For example, 4,500,000 rads are required to destroy *Clostridium botulinum*,[5] the most resistant of the spoilage bacteria (The *rad* is a unit of measure which represents the absorbed dose of any ionizing radiation which is accompanied by the liberation of 100 ergs of energy per gram of absorbing material For soft tissue, the *rad* closely approximates the roentgen equivalent physical [rep]) Non-spore-forming organisms usually require less than 1,000,000 rads When all spoilage micro-organisms are destroyed and the food is packaged so as to prevent entry of new ones, it generally becomes "shelf stable' and will keep indefinitely In some foods, however, enzymes remain which in time can cause undesirable changes

Radiation alone cannot effectively inactivate these enzymes, and, at present, heat treatment is the only practical solution Meats, fish, fruits, and vegetables all require a mild pretreatment with heat which need not seriously affect eating quality

Treatment with smaller quantities of radiation (100,000 to 500,000 rads) is referred to as pasteurization This method destroys only a percentage of spoilage micro-organisms When food thus treated is stored as it would be if not irradiated, surviving micro-organisms will take longer to build up spoilage-level populations[5] Radiation pasteurization usually extends the normal life of a food product and, in some instances, aids in its distribution and marketing

Problems

Unresolved major problems currently under study fall into two broad groups (1) changes in food characteristics and (2) safety of irradiated foods

Changes in Characteristics—Irradiation is distinctive in that it is a cold process The total energy striking the food as radiation is so small that the temperature rises only a few degrees There is no effect comparable to characteristic changes induced by cooking Radiation can induce an "off-flavor, however, which resembles that due to scorching The intensity of this 'off-flavor" depends on the amount of radiation employed and the particular food Most radiation-sterilized foods are less palatable than ones cooked when fresh A few exceptions include chicken, uncured pork, oysters, and shrimp, which do not develop the "off-flavor' and can be canned as sterile products of satisfactory quality In contrast, radiation-pasteurized foods show little or no flavor changes

Other changes can be induced by radiation cooked meats which are usually brown or gray are rendered pink, lettuce wilts, the thick white of eggs becomes thinner, and the baking properties of flour are impaired, particularly with regard to volume of baked goods Undesired changes are one of the most serious problems in the utilization of radiation as a means of food preservation Whereas certain additives and processing conditions reduce the magnitude of the damage, no method developed thus far has been totally effective and generally applicable Until these changes can be controlled more effectively, radiation preservation can have only limited use

Observed changes in nutritive value resemble those which occur with other preservation methods and, therefore, are not considered serious

Safety—Another problem area for radiation preservation involves safety Chemical changes induced in food could produce toxic substances and thereby render the food unsafe Extensive studies with animals, however, have not uncovered evidence of any toxic substances being formed Effect of both short and long-term animal feedings on growth, reproduction, general condition, and histopathology have been covered Studies in this area have been thorough, and, when they are completed, no other food preservation process will have been evaluated so carefully Two or three more years of work are needed before a final conclusion can be reached

The safety problem also involves control of radioactivity High-energy rays, such as 15-to-20 million-volt electron beams, can convert certain elements in foods to radioactive isotopes Voltages in excess of 5,000,000 probably cannot be used Thus, energy levels must be controlled carefully Gamma rays, such as emanate from Co^{60}, do not produce these isotopes unless contaminated with neutrons Induced radioactivity could be avoided by careful selection of the kind of radiation employed in the irradiation process

Current Status

Radiation preservation is still in the research stage A large step forward would be made if ways could be found to use sterilizing levels of radiation without adversely affecting food flavor Attention is being given to finding useful application of radiation pasteurizing levels which do not change flavor

Possibly other forms of spoilage can be controlled through radiation Radiation inhibits the sprouting of vegetables such as potatoes and onions[7] and kills insect eggs deposited on fruit, vegetables, and grain[8] Because only relatively small quantities of radiation (about 10,000 rads) are required, flavor alterations and other sensory changes do not constitute problems

Considerable effort has been expended in developing useful and economic sources of radiation Co^{60}, derived from exposure of cobalt metal to neutrons in atomic reactors, is a good possibility technically but is too expensive Fission products, such as cesium^{137}, might be available in the future at sufficiently low cost as a by-product of atomic reactor operations Electron generators are most economical at present Limiting electron beams to 5,000,000 volts reduces the thickness of food which can be treated to approximately two inches Since these electrons cannot penetrate as far as gamma rays their use may be limited

No irradiation process can be used until the United States Food and Drug Administration, and possibly other governmental agencies, approve it Such approval is not likely until present research involving animal-feeding studies has been completed Even with governmental approval, the public will have to be educated to understand and accept the safety of irradiated foods Thus, a number of problems need to be resolved before radiation preservation can be used, this method appears to be several years away from commercial utilization

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SPECIAL CONTRIBUTION

The Crisis at Guy's

Stanley A Plotkin, M D, Philadelphia

IN MEDICAL, as well as in any other form of history, there are small incidents which bring into focus great issues Such an incident was a dispute concerning the hiring of nurses and their functions which in 1880 thoroughly disrupted Guy's Hospital The outcome of the dispute symbolized the destruction of organized medical resistance to the idea that had been growing for 100 years of nursing as a profession

The establishment of secular nursing is inextricably bound to the work of Florence Nightingale The first training school organized according to her precepts opened in 1860 at St Thomas' Hospital in London During the succeeding 20 years, many other hospitals developed schools to train professional nurses for example, Liverpool Hospital in 1862, Edinburgh Hospital and New England Hospital for Women in 1872 Bellevue in New York in 1873, and St Bartholomew's in London in 1877[1] [2]

Although Guy's Hospital had been established long before as a leading medical institution, it was not until 1879 that a nurse educated under the Nightingale system was employed to reorganize its nursing staff[3] This tardiness reflected the conservative attitude of a significant part of the medical world with regard to nursing by "educated ladies" for example, four years before the Guy's Hospital training school opened, the medical officers of King's College Hospital acted to curb what they regarded as excesses of the new nursing system[4]

Thus the selection and training of nurses was far from a dead issue when on Nov 1, 1879, Miss Burt, the new "Nightingale-trained" matron, took charge of nursing at Guy's Apparently she came into immediate conflict with the staff physicians, for on Dec 29, 1879, the medical staff criticized the new nursing arrangements in a letter to the hospital's Board of Governors[5] (In his book, *Mr Guy's Hospital 1726-1948,* Dr Cameron[5] discusses the subject of the present article in some detail, though confining himself principally to the hospital's own records However, Dr Cameron differs from this writer in his view that the incident was an avoidable misunderstanding between the medical staff and the Governors, the latter group having been in the right) The letter produced little effect, but a similar one written in February, 1880, induced the governors to hear three days of testimony by the medical staff concerning the inequities of the new nursing system After hearing the testimony, the governors, through the Treasurer, Mr Edward Lushington, denied that fundamental changes had been made, but offered the concession of inviting the attendance of the medical staff at meetings of the superintendent and the matron *Lancet* commented that the exchange of letters did not seem likely "to produce more than a temporary calm"[6]

The calm was shattered indeed a few weeks later when an article entitled "The Present Crisis at Guy's Hospital"[7] appeared in the magazine *Nineteenth Century* The author was Miss Margaret Lonsdale, a writer of novels about nursing, who for five or six weeks just before the publication of the article, had been a nursing student at Guy's In her article she contrasted the new nursing system with the old, and made the following charges 1 The nurses at Guy's had been women of the charwoman class, whose moral character had not been adequately investigated, that they were wholly without training in the matter of nursing, and spent their leisure time too often, alas! in the nearest public-house,' from whence they returned 'at the regulation hour more or less the worse for drink' 2 The night nurses slept whenever they could, "regardless of the wants and dangers of their patients" 3 The nurses had been lacking in general education and special training It was conceded that a nurse might become expert in various ways, " especially in attendance upon the medical staff, and in prompt and skillful obedience to their orders She would learn to watch critical cases in the doctor's absence, and to act with ability under his orders After some years at her work it would be strange indeed had she not accumulated a certain amount of experience in the

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Associate Member, Wistar Institute of Anatomy and Biology treatment of various diseases of the particular kind she may have had to deal with in her own ward But all this time she must have remained in absolute ignorance of the first principles of nursing the sick ' 4 A doctor is not necessarily a good judge of the details of nursing 5 Doctors object to the new system, because they fear that public attention may be drawn to practices and experiments which are better not mentioned beyond the walls of a hospital," and because the presence of refined intelligent women in the wards imposes a kind of moral restraint upon the words and ways of both doctors and students, which some of them desire to get rid of 6 That the presence of the medical students in the wards is often 'a hindrance of a serious kind to the nurses work that students dare to go behind screens without asking the permission of the officiating nurse, and regard nurses as machines for answering questions and clearing up any mess they may choose to make ' That familiarity" existed between house doctors and nurses, and that this contributed largely to the low tone of morality for which the wards were remarkable

Reaction to the article was immediate Four separate replies were published in the May issues of the *Nineteenth Century* and the *Contemporary Review*[8, 11], three by attending physicians at Guy's Hospital W W Gull, S O Habershon, and W Moxon

The nurses of the old system were stoutly defended These were not drunken, immoral, untrained women, but valuable, efficient nurses who had served faithfully and intelligently, some of them for many years The charges against the night nurses are most unfounded In my earlier professional life, I have visited the wards at all hours of the night to attend upon some severe cases, and have often entered when I was not expected but I can say I never witnessed such things ' [9]

All of the replies stressed the absurdity of the idea that doctors were not good judges of nursing Dr Moxon sarcastically asked What are all these mysterious details of nursing of which doctors are not judges?—which it takes one, two, or even three years of severe training to acquire, which doctors cannot know except by results, what is all this occult and recondite mystery? [11]

In answer to the charge that the doctors and students were held in moral restraint by the new nurses, Dr Moxon queried, Does Miss Lonsdale think that in the presence of suffering, whose intensity calls for deep pity,—nay, whose awful hopelessness too often rather moves our reverence —we are to keep a slant eye on refined and intelligent women? Does she offer to men, so heartless as to be untouched by our crowds chosen from misery, the help of female influence? [11]

Dr Habershon also came to the defense of the medical students "But what is it that has made Guy's Hospital such a name in the world? Is it not the very presence of these students that insures accuracy of observation, and enables scientific details to be noted, which would otherwise be impossible? At the same time, the opportunities afforded to the students at the bedside for the study of disease have secured that skill and experience in the medical practitioner the benefit of which the public have so largely shared Anyone who has known the work of the students, and has heard the patients speak of their attention, can be a testimony to the estimate in which they are held by the inmates of the hospital " [9]

Dr Gull came closest to the heart of the nursing issue The true, and I believe the chief objection which medical men have felt against the new order of nursing is that it introduces a new element between them and their patients It had been naturally a recognized if not expressed principle both in hospital and private practice, that in the treatment of a patient that everything is to be subordinate to the purpose of the physician or surgeon ' [8] To which might be added Dr Moxon's comment, "The reader of Miss Lonsdale's paper might be struck with this—that she never, or hardly ever, says a word about the sick The nurse, who should be the means of relieving the sick, is made an end in herself, and I will say further, that the so called new system sacrifices the good of the patient to the training of the nurse and hence is opposed by the doctors " [11]

In a passage which gives us insight into the origin of some of the more vexing practices of present-day hospitals, Dr Habershon observed In former times it was the custom for the convalescents to have their breakfasts at 6 00, and to rise when the ward was warm and comfortable According to modern notions, it is thought desirable that the night nurse should make the beds, therefore the patients have been turned out at half past five For a patient just recovering from rheumatism or bronchitis to rise in a cold ward on a cheerless winter's morning, one hour and a half before breakfast (which is now given at 7 00), in order that the night nurse might attend to her duties, is not what we should consider good nursing Cleanliness is a most important point even in health, and still more needful in sickness, but life is better One of the new rules is to wash backs, and the nurse or probationer must obey her directions imagine the risk to a patient in the third or fourth week of fever, with whom a very slight movement might take away his chance of life by producing fatal perforation, but to carry out the new system he must be turned about, that the back may be washed, or he might get bedsore We think that it might be better to preserve the chance of life, than to let the patient die with a clean back ' [9]

In the June issue of *Nineteenth Century* Miss Lonsdale retracted her original charges,[12] but the basic cause of disagreement between the governors of the hospital and the medical staff was unresolved and was now public On June 15, the medical students took a hand in the dispute by hissing the Treasurer, Mr Lushington, as he walked through the hospital According to a letter to the London *Times* by Drs Mayland and Russell (respectively, the Senior House Surgeon and Senior House Physician), the hissing was conducted with the utmost decorum, and after deliberate consideration[13]

Within a month, the entire issue erupted following the death of a patient at Guy's under circumstances which led to a legal charge of manslaughter to be lodged against a nurse The latter had given a patient a cold bath on the authority of a head nurse and without permission of a physician, and the patient had died soon afterwards (A similar incident occurred in October A nurse in the surgery ward dressed a scalp wound of a man who had been knocked down by a cart, and sent the patient away without having him seen by a doctor The next day the man returned, and on examination by a surgeon a skull fracture was discovered the patient later died In excuse for her actions the nurse said, "As to directions with regard to consulting the surgeons, I have had none directly"[14])

The feeling of the Guy's medical staff concerning the state of nursing at Guy's were expressed in a letter to the Board of Governors written jointly by the Senior Physician, Dr Habershon, and the Senior Surgeon, Mr Cooper Forster The letter refused cooperation "so long as the present matron is maintained in office, and so long as the Treasurer continues the course of action which has led to our present disaster We cannot consent," it said bluntly, "to take part in a system which we and you alike know, by the unhappy experience of the last few months, to be in every respect mischievous"[15]

Said the *Lancet* " the system and principle of treatment by nurses or sisters is a most serious evil, and one which cannot be too strongly denounced Nothing should be left to a nurse, whether it be the use of a bath at discretion, or the exercise of judgment as to the expediency of getting a patient out of bed The physician's directions ought to be precise, and it is by failing to give definite instructions and leaving details to nurses, that the growth of nursing into a separate system has been encouraged"[16]

At their next meeting, in October, the governors issued the following resolution " it is the attitude of the medical staff which impedes the harmonious working of the hospital Dr Habershon and Mr Cooper Forster, having made themselves responsible for a circular in which they impute to the Governors that they knowingly persist in the mischievous system, are hereby required to resign the posts which they hold in the hospital"[15]

An emergency meeting of the medical staff unanimously requested the governors' permission to withdraw the letter, and added that Dr Habershon and Mr Cooper Forster had signed the letter on behalf of the staff, and that the staff was therefore collectively responsible for it

The Governors reciprocated by withdrawing the request for the resignation of Habershon and Cooper Forster, but the outcome of the exchange rankled the *Lancet* " the staff has hauled down its flag in the matter of principle by withdrawing a letter which, if not altogether wisely worded, was in fact and spirit a simple and manly statement of the facts, and the Governors had determined among themselves to make the most of a submission instigated as they assumed, by a selfish fear of the consequences, from a body of professional men who had rashly taken up a position of defiance they were not prepared to defend"[17] *Lancet* then went on to suggest that the only correct course for the medical staff to take was to resign in a body and to throw the responsibility for the institution and the pupils on the governors

No resignation came The reasons for the failure of the Guy's staff to do so were clearly stated by a member in a letter to the editor of *Lancet* dated Nov 13, 1880 "We are told that we represent the profession, and that it is humiliated If so, whence should have come our support? Of the dozen medical schools in London, which has moved to our assistance? Of the hundreds of teachers, two only have taken up our cause The profession has looked on amused, but not self-interested It would see the hospital dismantled, the junior staff ruined, and 400 students scattered to the winds before it would move a finger in our support, and further, we are assured on every side that there are hungry malcontents but waiting for the fall of the great reputation to rush in and plunder among the ruins"[18]

Nevertheless, several weeks later Dr Habershon and Mr Cooper Forster resigned, their positions having been made untenable by the action of the Board of Governors and by the retreat of the rest of the medical staff Their resignations were accepted by the Governors and successors quickly named to fill their places[19]

The Guy's staff was now satisfied with the situation, judging from the last mention of the dispute in the pages of *Lancet* "The medical session at Guy's Hospital was opened on Monday Mr Gibbs, President of the hospital, distributed the prizes gained by the students during the past year Dr Wilkes and Mr Bryant the new Senior Physician and Senior Surgeon in proposing and seconding the vote of thanks to the president, took occasion to assert that in the recent troubles at the hospital the efficiency of the medical school was in no way imperilled and that the privileges of the students in the wards had not been curtailed"[20] Thus the re volt of the medical staff ended "not with a bang, but with a whimper"

In an editorial published in the midst of the controversy, the *Lancet* gave the following appraisal of the issue "Whereas the grand engagement at a metropolitan hospital is just now the center of interest, the conflict on this particular field is only one episode in a campaign on the final issue of which the best interest of the sick poor, and of medicine as an art, if not also as a science, depend ... hospitals are not homes for the sick with medical advice as an adjunct, but institutions wholly medical in character and purpose and therefore they must be under direct medical control"[21]

The current vitality of this issue may be judged by a recent article concerning American hospital administration, in which the author says "Although the physician is the key figure in the voluntary hospital in this country, hospital organization and administration neither reflect the doctor's actual role nor assign him a role that assures the highest possible quality of patient care"[22]

The crisis at Guy's thus epitomized the passage of the control of hospitals from the medical to the nursing staff Whether the present arrangement in which patient care is largely the province of the nurse is justified by its fruits is a question meriting considered judgments, although generally more productive of strong opinions

Wistar Institute (4)

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ARCHITECTURE OF MEDICINE —We are indeed justified in saying that not only has Fernel left us an admirable exposition of the Science of Medicine, as he saw it, but one that still influences profoundly the teaching of many who believe the true foundations of Medical Science to have been discovered since the Great Exhibition of 1851 But the twentieth century has as yet produced no such ordered and orderly presentation as did the sixteenth of the known facts concerning disease duly set out and interpreted with respect to definitions, stated first principles enunciated doctrines and terminal conclusions embracing (as must any Science of Medicine) consideration of metaphysical problems of one kind or another, whether in relation to mental disease or to the understanding of the normal functioning of the body, and making at any rate some allusion to the epistemological and ontological questions which lie at the very base of the superstructure we call Science We accumulate and persist in accumulating *ad infinitum* records of our passive perceptions and we surround ourselves with a vast assembly of material some of which is here and there neatly docketed and sorted out Hither and thither we may roam at our will constructing now with a Grecian capital, now with a Roman brick or two and now with the fragments of a Gothic arch, some temporary shelter for ourselves against the desolating bleakness of instructed criticism Some of us may even set up little composite altars at which we and a few special adherents may worship—for a time But no Temple arises to take the place of those long since fallen in ruins Our best efforts at syncretism have given us not a Pantheon but rather a Madame Tussaud's Wax Works which, with the aid of modern journalism serves to interest the public and sometimes to obtain Government Support —C G Cumston Introduction to History of Medicine From Time of Pharaohs to End of Eighteenth Century, New York, Alfred A Knopf, 1926

CLINICAL SCIENCE

An Embryologically Derived Classification of Ovarian Tumors

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The following classification of ovarian tumors has an embryologic foundation, with the cellular background of the tumors determined in embryonic life and their differentiation into the various types determined by the genetic potentialities of their cells of origin This results in attempts by the tumor to recapitulate in morphology the various stages in the development of the urogenital ridge, namely, the mullerian apparatus, germ cells, primitive gonads, and adrenals

Embryology [1,2]

The genital system first appears in the fifth to sixth week of embryonic life as an undifferentiated structure, with the occurrence of a localized thickening, the urogenital ridge, on each side of the dorsal mesentery bulging ventrally into the coelom This common fold subdivides longitudinally into a more lateral mesonephric ridge and a medial genital ridge Both sexes develop a pair of female ducts, the mullerian ducts, as the result of a groove developing in the thickening epithelium of each urogenital ridge lateral to the mesonephric duct (fig 1) The groove advances caudally with the lips closing into a tube and swings medially to the midline near the cloaca, fusing into the genital cord When somatic sexual differentiation occurs, the fused common mullerian duct develops into the upper vagina and uterus while the more separate cranial portions form the fallopian tubes

The sexual primordium is identical whatever the genetic sex of the embryo At six weeks the primitive gonad is composed of the thickened coelomic epithelium or cortex, an underlying loose mesenchyme or blastema, and germ cells beneath the coelomic epithelium (fig 2) The germ cells arrive in the primitive gonad by migrating from the endoderm of the yolk sac cephalad by way of the dorsal mesentery The somatic parts of the gonads are sex inductors for the germ cells, i e, germ cells enclosed in an ovary (cortex) differentiate as ova, and those enclosed in a testis (medulla) differentiate as spermatozoa Several weeks after the gonad of the male has declared itself as a testis, the primordial sex gland of the female begins to exhibit distinctive ovarian features The main features of ovarian development are the persistence and increase of the cortex The germinal epithelium proliferates, with the cortex increasing in thickness, cortical sex cords push into the gonads, and the medullary component with the primary sex cords recede

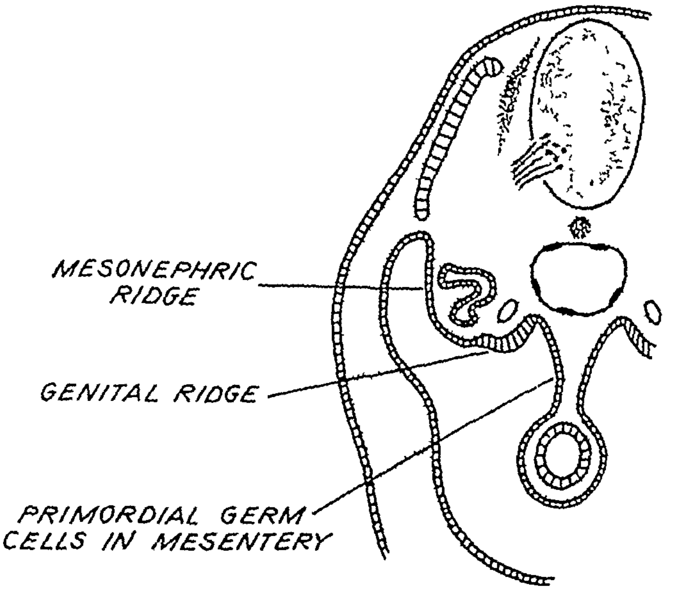


Fig 1 —Figure showing urogenital ridge (7 mm embryo)

Chief, Department of Pathology Permanente Medical Group

Read before the Section on Obstetrics and Gynecology at the 109th Annual Meeting of the American Medical Association Miami Beach Fla, June 13-17

Thus the undifferentiated gonad has two major bisexual somatic components, the cortex and medulla, in addition to the germ cells The cortex plays the major role in ovarian differentiation and the medulla in testicular differentiation The dominant element usually conforms to the genetic sex of the zygote and the recessive element retrogresses

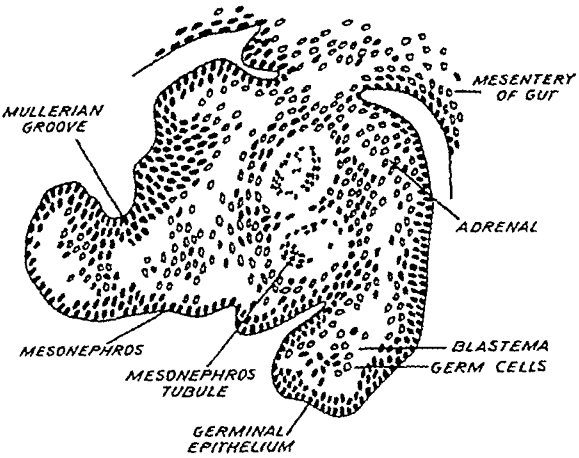


Fig 2 —Figure showing gonadal anlage (12 mm embryo)

Each component may produce a morphogenetic substance antagonistic to the other with ovarian differentiation resulting from production and prevalence of a cortical substance over a medullary one, with resultant inhibition of medullary development and feminization of the germ cells

Classification

CLASSIFICATION OF OVARIAN TUMORS

I MULLERIAN

II GONADAL BLASTEMA

III GERMINAL

IV HAMARTIAL

The tumors of the ovary can be divided into four general categories (1) those which attempt to recapitulate in their structure the mullerian apparatus, (2) those which attempt to reproduce the phases in the development of the indifferent gonad into its cortical and medullary components, (3) those of germ cell origin which may exhibit trophogenesis and/or teratogenesis, and (4) those of hamartial origin representing tumors derived from rests of cells from the closely related developing adrenal gland

Mullerian Origin

I MULLERIAN

- A NON-NEOPLASTIC
  - 1 PSEUDODECIDUOSIS
  - 2 GERMINAL INCLUSION CYSTS
  - 3 ENDOMETRIOSIS
  - 4 WALTHARD REST
- B NEOPLASTIC
  - 1 ADENOFIBROMA
  - 2 SEROUS CYSTADENOMA AND CARCINOMA
    - a HYPERNEPHROID CARCINOMA
  - 3 MUCINOUS CYSTADENOMA AND CARCINOMA
  - 4 BRENNER TUMOR
  - 5 ADENOACANTHOMA
  - 6 MULLERIANOSIS

A number of non-neoplastic lesions of the ovary originate from the subepithelial stroma of the ovary and the overlying germinal epithelium, both of which go into the formation of the mullerian ducts The subepithelial mesenchymal layer in the adult ovary retains the embryonic potentialities of mullerian epithelium and is therefore totipotent for a number of diversified structures Among these are the ectopic decidual reaction of pregnancy, the pseudodecidual reaction[3] observed in the nonpregnant patient, and proliferation of the germinal epithelium downward into the cortical stroma with formation of germinal inclusion cysts

Many of the neoplastic derivatives of mullerian origin originate from downgrowth of the surface or germinal epithelium,[4] which is of the same origin and character as the coelomic epithelium that lines the mullerian ducts The proliferation of the ovarian cortical stroma in association with multiple inclusions of germinal epithelium results in production of an adenofibroma This tumor is analogous to benign germinal inclusion cysts associated with cortical stromal hyperplasia and represents the simplest recapitulation of the formation of the mullerian duct A serous cystadenoma is formed by tubal differentiation of the displaced germinal epithelium, while cervical differentiation results in a mucinous cystadenoma Not infrequently the tumor will show both types of epithelium indicating a common histogenesis Adenoacanthomas are adenocarcinomas with squamous metaplasia and are similar to tumors found in the endometrium These cases usually fall into two categories those originating in areas of endometriosis, and those originating from a serous cystadenocarcinoma[5]

The Brenner tumor[6] which lends itself to inclusion in this group, is thought to be derived from Walthard cell nests These cell nests are composed of indifferent epithelial cells originating from the coelomic or mullerian epithelium and possess mullerian potentialities The close resemblance of the epithelial cells in the Brenner tumor of the Walthard cell nests and the not infrequent direct transition to a *mucinous cystadenoma* suggest a histogenesis common with the latter.

The ovary may exhibit a diffuse, nonlocalized, histologically benign proliferation of germinal epithelium with invagination into the stroma, the formation of multiple cysts with papillary infoldings, and papillary projections from the surface, often with tubal differentiation of the epithelial lining and calcified psammoma bodies in the papillae. This process may be bilateral and may be extragonadal, occurring on the surface of the tubes, uterine ligaments, and uterus. These tumors are believed to be derived from mullerian directed elements and the lesion is termed "mullerianosis," to emphasize the benign but locally aggressive nature of the lesion and its distinctive histogenesis.[7]

The hypernephroid carcinoma upon careful examination will usually show areas typical of a papillary serous adenocarcinoma, and should therefore be described as a variant of this tumor and not as a separate distinct entity.[5]

Gonadal Blastema Origin

II GONADAL BLASTEMA

1. **GONADOBLASTOMA**
2. **ANDROBLASTOMA**
3. **INTERSTITIAL CELL TUMOR**
4. **GRANULOSA AND THECA CELL TUMORS**

The tumors which originate from the gonadal blastema recapitulate the various phases in the development of the primitive gonad into its male or female derivatives.[8] The strict control that directs the differentiation of the primitive gonad into either an ovary or a testis can be so deranged in neoplasms that structures reminiscent of either ovarian or testicular supportive stroma may develop.

The androblastoma[8] originates from the primitive gonadal blastema and is composed of male directed cells. This tumor reflects in its various patterns the cytoarchitecture of the developing testis. The diffuse variety resembles the undifferentiated blastematous areas in the embryo. Differentiation is indicated by a cordlike arrangement or imperfect tubule formation, while the highly differentiated type reproduces testicular tubules, lined by cells analogous to Sertoli cells, capable of estrogen secretion. Androgen production by these tumors is related to the presence of specialized stromal cells analogous to Leydig or interstitial cells. Leydig or interstitial cells may differentiate from the blastema, overgrowing other elements to produce tumors made up entirely of these cells, and these are known as interstitial or Leydig cell tumors.

The same gonadal blastema may also be the site of origin of the granulosa-theca cell tumors.[9] This female direction in the differentiation of tumors arising from the mesenchymal core of the ovary occurs much more commonly than the male counterpart. The mature, immature, and intermediate varieties of granulosa cell tumor are analogous to the patterns described for the androblastoma, and represent reproductions of all the features of the supporting tissues seen in the female gonads. The resemblance of a thecoma morphologically to cortical stromal hyperplasia and the high incidence of cortical stromal hyperplasia in the opposite ovary suggests origin of the theca cell tumor from the mesenchyme of the gonadal blastema. In many cases a thecoma occurs in association with a granulosa cell tumor and occasionally there is great difficulty in differentiating a thecoma from a granulosa cell tumor, all of which is consistent with the view that the elements found in these tumors have a common histogenesis. An ill-defined histologic border exists between the undifferentiated forms of granulosa cell tumor and androblastoma.[8] This results from the common origin of the two tumors from the primitive undifferentiated gonad and the attempt to recapitulate the structure of this organ. Undifferentiated tumors would be better referred to as tumors of gonadal stroma. The luteoma is a luteinized theca cell tumor. The fibroma is an involuted theca cell tumor. Neither would appear to be worthy of separate classification.

The gonadoblastoma[10] contains components of gonadal blastema origin and cells of germ cell type. Since these tumors recapitulate more fully than any other tumor type the embryologic development of the entire gonad, they are called gonadoblastomas and serve as a link between this group of tumors and the next group to be discussed, those of germ cell origin. The gonadoblastoma shows in part dysgerminomas and Sertoli or granulosa cells and Leydig or theca cells.

The histogenetic unity of various forms of differentiation imitating phases in the development of the male or female supportive stroma are evident from comparative studies which reveal morphologic identity of ovarian and testicular androblastomas and granulosa-theca cell tumors in both organs.[11]

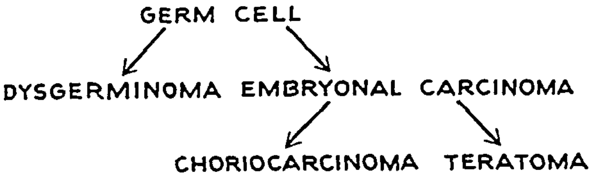
Germinal Origin

III GERMINAL

1. **DYSGERMINOMA**
2. **EMBRYONAL CARCINOMA**
3. **TERATOMA AND TERATOCARCINOMA**
4. **CHORIOCARCINOMA**

The germinal series of tumors is thought to arise from a totipotential germinal cell since the tumors show a multipotentiality which approaches that of the germ cell itself It seems likely that a tumor which can show both somatic and trophoblastic differentiation should arise from the only cell having such potentiality, namely, the germ cell [12]

GERMINAL SERIES



The germinal tumors are composed of one or any combination of four basic patterns [13] The dysgerminomas are of either germ cell origin or actually represent the primordial tumor cell The embryonal carcinoma is a primitive cell type manifesting biphasic potentialities and is the precursor of the differentiated trophoblastic and teratomatous growths, namely the teratoma and the choriocarcinoma Normally in the embryo trophoblasts and somatic tissues develop from the primordial cells, and therefore these neoplasms show a parallel relation to normal development The different incidence of these tumors in both sexes may be due to something in the female environment predisposing to adult somatic differentiation of the embryonal carcinoma into teratomas or dermoid tumors while the male environment fosters undifferentiated malignant growths [13] Many of Schiller's mesonephromas probably are embryonal carcinomas

Hamartial Origin

The adrenal glands originating from the mesonephric blastema form the primordia of the cortical adrenal and later are joined by medullary cells of sympathetic origin The cortical cells lie in close contact with the primordial gonadal fold and it is not surprising that as high as 20 per cent of hysterectomy specimens are reported to contain ectopic adrenal cortical nodules in the broad ligament [14] Adrenal cortical tumors may occur in the ovary and must be distinguished from other tumors containing vacuolated cells

Summary and Conclusions

The above represents a working hypothesis of the histogenesis of ovarian tumors This type of classification serves as a useful tool in the understanding of this very complex and at first seemingly unrelated group of neoplasms

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NEW HORIZONS IN CHEMISTRY —Organic chemistry is one of the most remarkable of all the sciences, and is usually regarded by the layman as one of the most abstruse and remote from everyday life and thought This view is, perhaps, based on its content of jargon and its use of abbreviated molecular formulae as a kind of hieroglyphic script It is difficult to believe, however that a science can properly be described as abstruse which permeates almost every material aspect of modern civilization, which stands as the bridge which links the physical with the biological sciences, and which is, perhaps the biggest of the sciences in its factual content and in the number of its adherents Organic chemistry is, perhaps, the most logical of the sciences, and in its history of about 150 years it has suffered fewer theoretical upsets than other sciences —A Todd, F R S New Horizons in Chemistry *Nature*, Sept 3, 1960

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NIDATION OF THE OVUM

THE second stage of one of the most important biological functions of life, nidation or implantation of the fertilized egg in the endometrium, remains an incompletely understood phenomenon [1] Recent studies utilizing modern techniques of microbiochemistry and electron microscopy have revealed new evidence or have confirmed hypotheses that were formulated by means of less precise procedures Cleavage of the egg begins shortly after fertilization Mitosis at this phase is a normal process After the eight-cell stage of the ovum, many of the peripheral cells divide more rapidly than the cells placed centrally Fluids accumulate in the intercellular spaces between the center and the peripheral structures—the trophoblast The vesicle, a mass of cells with the eccentrically placed inner cell groups, is identified as the blastocyst Cell division and differentiation up to this stage occur before the egg has finished the trip down the uterine tube The time of transit of the egg requires one day in the opossum, seven days in the dog, and three or four days in most mammals Neither the size nor the length of the tube appears to influence transit time Once the blastocyst appears in the lumen of the uterus, an additional 24 to 48 hours elapse before attachment to the uterine wall may be detected Implantation may be delayed for as long as 10 months in the European badger

Hormones, which play such a vital role in conception, reappear in the preimplantation processes The luteal hormone of the ovary, progesterone, is required for persistence of the blastocyst and participates in the preparation of the endometrium for the receipt of the egg on its way to maturation The maternal component of the placenta, the decidual cells of the endometrium, make ready for implantation in the prenidation hours The formation of the placenta, accomplished by the fusion of the fetal membrane to the uterine mucosa, is obligatory for nutrient interchange Structural alteration in the endometrium may be detected immediately after ovulation, in anticipation of fertilization If the latter is not an eventuality, restoration of the endometrium is inevitable If fertilization is factual, the endometrial processes continue A number of substances increase in concentration in the uterine tissue, in anticipation of physiological progress These include several enzymes, vitamins, and polysaccharides An increase of blood supply and lytic activity of the trophoblast becomes apparent In addition to the luteal hormone progesterone, estrogens participate in markedly enhanced concentration They release histamine as an integral process in the pathogenesis of the phenomenon of implantation If small amounts of an antihistaminic solution are instilled into the uterus, decidual activity is blocked and pregnancy is terminated Still other local changes occur, relating to the endometrial blood supply, the metabolism of the blastocysts, and chemical changes in the decidua [2] These ultimately will have to be related to the changes just described

At this stage the connective tissue mast cells participate [3] The endometrium normally is rich in mast cells Almost complete depletion of this specific structural unit occurs during the 24 to 36 hours before the blastocyst becomes imbedded in the endometrium The surge of estrogens leads to the release of histamine, which transforms the endometrium into a decidual nest As decidualization begins, tissue lysis—an activity measured by release of protein by the endometrium—may be detected before any structural changes are apparent The endometrial cell promotes receptivity for the invasion of the blastocyst under the influence of the estrogen surge and histamine release This description of the phenomenon of nidation is reduced to relatively simple terms The general features in the phenomenon appear to be well established More precise definition of this complex and vital physiological process remains to be discovered

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DANGEROUS DUSTS AND FURTIVE FUMES—"NEW" AND RESURRECTED

If there is any truth in the old adage about there being "nothing new under the sun," then American industry and the American medical profession seem to be creating an interesting illusion, since the one continues to produce and the other to recognize what appear to be "new" diseases But appearances may be deceiving, and that which at first glance seems so original may, on closer scrutiny, prove to be but a reincarnation of the old

To the long list of time-honored occupational diseases of the lungs—the more important mineral dust pneumoconioses, of which silicosis, berylliosis, and asbestosis are familiar examples, and the less well-defined illnesses associated with the inhalation of organic dusts such as cotton, hemp, and pepper —there has recently been added a growing number of intriguing new' disorders, of a similar nature, which are as yet poorly understood In addition, other previously recognized, but little remembered, illnesses of this type have gained or regained positions of importance in the last few years and thus have received more attentive re-emphasis

In the latter category, a mysterious, pneumonia-like illness with the improbable designation of *bagassosis* represents the most notable example The disease results from contact with the dust of dried sugar cane fiber, or bagasse (Fr meaning worthless even a disreputable woman), a residue of the process by which sugar is extracted from cane Formerly true to its name and discarded as of no value bagasse has gradually gained a position of considerable industrial importance and is now used extensively in the manufacture of wallboard, paper, and other items Although the relationship between inhalation of bagasse dust and a resulting respiratory illness was recognized as early as 1937, the first case of bagassosis was not reported until 1941 For many years the disease was considered to belong exclusively to Louisiana, resulting only from contact with cane grown in that state Only 58 cases had been reported in the worlds medical literature prior to 1958—from the United States, England, Italy, and India—and the disorder was regarded as little more than a medical curiosity As a result, relatively little attention has been directed toward this illness either by the industries which gave it birth or by the rebuffed profession which might have brought about its early end

However, during the past few years, Buechner and his co-workers have emphasized the potential resurgence of bagassosis as an occupational hazard, since bagasse is being used more extensively for manufacturing purposes (this issue, p 1237) The accuracy of this prediction was dramatically brought into focus with the recent (1959) occurrence of approximately 80 cases of bagassosis at a newly established paper mill in Arecibo, Puerto Rico There now appears to be little doubt that this illness will continue to occur in widespread areas of the world as the industrial use of bagasse is expanded The sudden and serious outbreak of the disease in Puerto Rico caused a frantic appeal for information pertaining to its characteristics by officials of industry and by members of the medical profession in that area The lack of knowledge of the condition and the need for a more determined effort to gain a clearer understanding of the precise etiology, pathology, physiology, sequelae, and geographical distribution of bagassosis were strongly emphasized

Another disorder in the "revival" group, remarkably similar to bagassosis and known since 1932, was redescribed and re-emphasized in 1958 by Frank,[1] and Dickie and Rankin,[2] who together reported 66 new cases at that time Designated as *farmer s lung*, the illness occurs in agricultural and dairy workers who come in contact with moldy hay, grain, fodder, and silage Believed to be caused by a direct effect of inhaled organic material and a later hypersensitivity to the products of fungi, the disease is abrupt in onset and is usually characterized by fever, chills, malaise, weight loss, headache, dyspnea, cyanosis, cough, and hemoptysis Lung biopsies have disclosed an acute, granulomatous interstitial pneumonitis The similarity between farmer s lung and bagassosis may be more than a coincidence, and the one may represent only a variant of the other, since bagassosis apparently occurs only from contact with old bagasse which frequently contains as many as 500 million fungus spores per gram

In the legitimately 'new" category, a puzzling respiratory illness has recently (1959) been described by Bringhurst, Byrne, and Gershon-Cohen [3] among workers engaged in the commercial cultivation of mushrooms Clinically resembling both bagassosis and farmer s lung, the disorder has shown a mysterious predilection for migrant Puerto Rican laborers Its precise etiology has not yet been determined, but all of the 16 patients reported had contact with a compost of horse manure When fresh, this material might generate small quantities of nitrogen dioxide gas, and, when old, it is covered by a thick, white mold Either or both of these substances could represent the causative agent The original description of this illness affords it no specific name, but *mushroom-worker s disease* seems most appropriate

Although the farmers of Wisconsin had long been familiar with a brown or yellow gas which accumulated in the lower levels of silos and occasionally caused the death of chickens and cattle, human illness resulting from exposure to this agent was not recognized until 1956 Delaney, Schmidt, and Stroebel [4] and Lowry and Schuman [5] reported 6 cases under the designation of *silo-filler's disease* As the name implies, the disorder afflicts farmers who work with corn silage inside closed silos The gas apparently is highly toxic nitrogen dioxide, derived from the reduction of nitrates in the corn Closely similar to bagassosis and farmer's lung, from a clinical standpoint, this illness differs from the others in that a peculiar recurrence of symptoms tends to occur after apparent recovery Its basic pathology is an acute, chemically produced, pulmonary edema, and subsequent bronchiolitis obliterans, rather than a granulomatous pneumonitis Identical disorders were previously observed in patients exposed to the fumes of burning cellulose nitrate x-ray films, which release significant quantities of nitrogen dioxide

Nor is the breadwinner alone a victim of these noxious agents In her quest for beauty, even milady's boudoir may be the place of exposure Bergmann and others[6] have recently (1958) described two cases of pulmonary *thesaurosis* in young women, attributed to the inhalation of hair spray Diffuse, bilateral infiltration of the lungs was noted in association with hilar adenopathy Biopsy of a scalene lymph node in one case disclosed a granulomatous reaction, with phagocytized material in the epithelioid cells It is postulated that some type of naturally occurring or synthetic resins may be the offending agents Macromolecules of these substances, being unable to pass the glomerular barrier, are deposited in the reticuloendothelial system, including the lungs The changes are apparently reversible, and spontaneous recovery takes place

So the list of these inhalational disorders continues to grow Clinically alike, and perhaps related in some cases by common etiological factors, much remains to be learned of their characteristics It is said that Alexander wept when he learned that there were an infinite number of worlds and he had *not yet conquered one* What, then, should we do when we continue to encounter the new without yet understanding the old?

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IN A SINGLE CAPSULE

It is assumed by an unsuspecting public that maximum health, longevity, and "super-duper" vitality can be stored in a tiny vitamin capsule An intriguing concept is that this colorful panacea will add tremendously to the drab victuals at mealtime What would become of us if our growth and sustenance depended merely on green vegetables, meat, bread, and dairy products? Thus, the broad-shouldered citizen will turn from a hearty meal to swallow a tiny capsule, the frail, overwrought housewife will take her vitamin formula regularly to overcome the fatigue of many chores Both will excuse themselves to extract from a pillbox the vitamins to make them feel better and better and better

Is the well-balanced meal becoming passé? Are we turning away from mother's meat and vegetable stews, her tasty recipes? The pity of it all is that vitamin administration reflects the hazards of self-medication Witness the vitamin addict who strives for maximum health by taking the most recent combinations, the greatest elaborations of supplementary food substances, fearing that his vitamin D enriched milk, his C-fortified orange juice, his niacin enriched bread, and his B-plenty cereal are insufficient Little is he aware that hypervitaminosis may result, that roughening of the skin is not the demand for more vitamin A but the result of too much, that excessive vitamin D may cause renal damage and even depression The tragedy is that masked organic disease may be the basic cause of symptoms that are being treated erroneously with vitamin preparations

The vitamins constitute a group of organic compounds which are essentially catalytic agents They are compounds of enzyme systems which facilitate various metabolic reactions It is significant that only minor quantities of these essential organic catalysts are required for the vital metabolic reactions It may be emphasized that vitamins came into prominence largely because of the occurrence of deficiency diseases, notably such phenomena as rickets, scurvy, and beriberi in depressed areas of the country With experimentation and clinical observations it has become apparent that vitamin deficiency in persons able to follow an adequate dietary is comparatively rare Logically, therefore, supplementary vitamin administrations should be a part and parcel of medical care—not self-imposed by the patient, but actually prescribed by the physician

The modern processing of foods, expedited transportation, and refrigeration exclude almost all possibilities of vitamin deficiency, it would appear sensible, therefore, for the housewife and the restaurateur to take over the responsibility of providing a well-balanced meal and for the physician to assume the responsibility for prescribing vitamin supplements in potential or frank deficiency states

PRIMARY URETERAL CARCINOMA

Primary ureteral carcinoma is a disease entity which previously had been thought to be quite rare The consensus presently, however, is that it is more of an uncommon entity than a rare one

In any patient presenting with hematuria, pain, and possibly a palpable mass, a primary ureteral carcinoma should be considered in the differential diagnosis The most useful diagnostic adjunct is a retrograde bulb pyelo-ureterogram It will usually reveal a non-opaque translucent filling defect in the ureter, which is compatible with other conditions as well The differential diagnosis rests between non-opaque calculus, blood clot, inspissated pus, and ureteral tumor A persistent filling defect should arouse suspicion as to the presence of a ureteral tumor Once a tentative diagnosis of ureteral tumor has been made, exploration of the ureter at the site of the defect is indicated If a tumor is found on exploration, the definitive surgery is a complete nephro-ureterectomy when there is a chance for cure The only factor which may alter this choice is the function of the opposite kidney

In the case reported in this issue of THE JOURNAL, p 1325, a primary ureteral carcinoma was diagnosed prior to surgery The choice of surgery had to be altered due to the previously mentioned factor It has been almost two years since surgery, and the patient is alive and asymptomatic

CARCINOMA IN SITU AND INVASIVE CARCINOMA OF CERVIX UTERI

Hertig and Gore, in *Tumors of the Female Sex Organs*,[1] discuss the much debated question of the relationship of carcinoma in situ to the invasive squamous cell carcinoma of the cervix In the statistics of Corscaden, quoted by Hertig and Gore, carcinoma of the cervix occurs at the rate of 34 3 cases per 100,000 female population in New York state, exclusive of New York City Squamous cell carcinoma constituting 90 to 95% of all cervical cancers, comprises 11% of all malignant neoplasms (irrespective of sex) Of female genital tract cancers, those of the cervix account for 55 to 65% of the total and are second only to breast cancer in their relative frequency in women Squamous cell carcinoma of the cervix does not usually occur before the third decade and is most common in the fifth and sixth decades It develops at the junction of the squamous and columnar epithelium, usually on the endocervical side It is most often associated with the inflammation and epithelial regeneration which follow pregnancy and childbirth The early lesion may be neither visible nor palpable and may be diagnosed only by biopsy and microscopic examination That squamous cell carcinoma in situ is an early stage of invasive carcinoma has been taken more or less for granted but has not been definitely proved

Hertig and Gore emphasize that the accessibility of the cervix to inspection, palpation and biopsy, offers an excellent opportunity to study the etiology and pathogenesis of neoplasms especially those of an epithelial nature The morphologic sequence leading to squamous cell carcinoma has been studied best in the cervix

The normal cervix is covered in its vaginal portion by stratified squamous epithelium, while the cervical canal is lined by columnar epithelium Various portions of the surface columnar epithelium of the cervical canal and the glands or crypts derived therefrom may be replaced by squamous epithelium This phase is referred to as squamous cell metaplasia Some pathologists use the term epidermidalization to describe the replacement by true squamous epithelium from the portio vaginalis of the endocervical epithelium and glands exposed by eversion and subsequent erosion The importance of squamous cell metaplasia lies in the fact that often its pattern and occasionally its pleomorphism are suggestive of carcinoma Squamous cell metaplasia may well be related to the pathogenesis of carcinoma, but such a relationship is still unproved

Hertig and Gore define carcinoma in situ or Bowen's disease as morphologically malignant, the non-invasive squamous epithelium involving the surface, or both the surface and gland lumina, of the cervix without invading the stroma These authors state that there are no characteristic gross features of carcinoma in situ Squamous cell carcinoma in situ usually arises on the endocervical side of the junction of the squamous and columnar epithelium and may extend upward into the endocervix, out to the portio, or in both directions The cervix is frequently distorted by eversion, erosion, or laceration, since this lesion usually occurs in women who have borne at least one child In the nulliparous patient, carcinoma in situ is usually at the margin of a congenital erosion Erosion is the commonest associated finding (79 3%), although the portio may be covered with smooth intact epithelium and appear completely normal The cervix may bleed easily when touched with a cotton swab The Schiller test is a staining technique using a dilute aqueous solution of iodine (one part iodine, two parts potassium iodide, and 300 parts water) to determine the presence or absence of glycogen in the cytoplasm of the superficial squamous cells in the epithelium of the cervix and vagina It does not stain columnar epithelium, whether lining the endocervical canal or covering the surface of cervical erosions, eversions, or ectropions The test is considered positive when grossly normal-appearing squamous epithelium fails to turn dark brown on contact with the solution

The microscopic criteria of carcinoma in situ are those of morphologic malignancy in any squamous epithelium These criteria include loss of stratification, loss of polarity, and cellular pleomorphism with increased—and often abnormal—mitotic activity throughout the epithelium It is believed that the morphologic entity called carcinoma in situ, unless destroyed or surgically removed, inevitably proceeds to carcinoma of the cervix

A number of observations support the idea that carcinoma in situ is probably the preinvasive stage of cervical cancer Carcinoma in situ appears at a somewhat earlier age than carcinoma of the cervix A few cases of apparently pure carcinoma in situ show, in serial block section of the entire cervix, unquestioned evidence of early stromal invasion Vaginal and cervical smears from patients with carcinoma in situ often contain malignant cells which are indistinguishable from those found in cases of invasive carcinoma Of the first vaginal smears taken from patients with carcinoma in situ 82% contain malignant cells, 87 to 99% of such smears from patients with invasive carcinoma contain malignant cells This suggests that carcinoma in situ is an early stage of invasive carcinoma Cuyler states that both carcinoma in situ and invasive carcinoma exfoliate similar types of cells By examination of vaginal and cervical smears from patients with carcinoma in situ, he was able to make a definitive diagnosis of carcinoma in situ in only 12 5% of cases, whereas 81 1% contained exfoliated malignant cells

Carcinoma in situ of the cervix, or a lesion that simulates it, appears to occur more frequently during pregnancy than during the nonpregnant state According to Stoddard, quoted by Hertig and Gore, "There is rather general opinion that carcinoma in situ discovered during pregnancy may regress afterward For this reason, the diagnosis of in situ carcinoma during pregnancy is taken with reservation even by some who consider the lesion inevitably invasive"

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1 Hertig A T and Gore H Atlas of Tumor Pathology Tumors of the Female Sex Organs Part 2 Tumors of the Vulva Vagina and Uterus Published by the Armed Forces Institute of Pathology under the Auspices of the Subcommittee on Oncology of the Committee on Pathology of the Division of Medical Sciences of the National Academy of Sciences—National Research Council, Washington D C, 1960

MEDICAL HIPPOPHILE

Not all horse doctors are veterinarians, at least not all horsey doctors are ecozoiatrists M Murray Nierman, an Associate of the American Academy of Dermatology and a professed reader of the *Archives of Dermatology* as well as the *Daily Racing Form*, has been victimized by dual loyalties, horses versus patients The jacket of his recent literary effort, *Patients and Ponies*,[1] confesses inoculation with the horse racing bug while he was still a student in medical school My parents had led me to believe that this sickness was an hereditary malady and essentially as stigmatizing as syphilis or atheism Although *septicemia eohippus* (Gr *hippos*, horse) is reported to be incurable, many of those afflicted find it a lingering malady I should have noted earlier that neither Nierman's skill as a dermatologist nor the scars on his horse-bitten soul penetrated as deeply as his talents for satire and affection for travesty

One, Miss Lewis, was his first literary critic, who contributed to the dermatologist's scrivening in a position similar to that of a patrol judge in a horse race "Her job was not to call the order of finish or judge the photo, but rather to point out the fouls committed during the running of the race Miss Lewis told me, in no flattering terms, that I was 20 years ahead of my time (in my first essay, 'The Wonder Patient') In this piece I alluded to bowel malfunction much too loosely I used the word 'diarrhea' three times in a sentence—which is loosely indeed, no matter how you look at it 'Miss Lewis,' I said, defending myself, 'authors write freely and uninhibitedly of sexual intercourse, menstruation, abortion, etc in national weekly magazines and in best-selling books What's wrong with diarrhea?' 'Doctor,' Miss Lewis said in an epic retort, 'the world has already accepted sex It is not quite ready for elimination'"

In another instance, Nierman was accused of referring too frequently to diseases, particularly "'creeping eruption,' a disease found on horse owners who own very slow horses According to Miss Lewis, only a dermatologist would understand that I had news for Miss Lewis—only a dermatologist who owns slow horses could understand that and suffer from it" Miss Lewis also raised the question that some of the references might offend certain religious groups There was some doubt that the story of a Catholic hospital would offend many of this faith The story was published in *Sign*, not a "horse-picking sheet, but a nationally distributed Catholic lay magazine" I pray that it will not offend the readers of *J A M A*

"It's been my experience that those in the clergy have vastly better and broader senses of humor regarding stories related to religion than the non clerical I had stopped to look at one of the religious paintings on the walls of a Catholic hospital where I am an attending physician There are four figures represented in the painting A patient is lying in bed, obviously in distress, and looking up towards the doctor, who sits at the patient's bedside, just as obviously puzzled by this medical problem On the other side of the bed a nurse stands by for instructions Behind the doctor, looking over his shoulder and offering the physician spiritual assistance, is a magnificent figure clad in white robes—the figure of Jesus Christ A hospital Nun stopped by my side She saw that I was struck by the dramatic impact of this portrait of a hospital scene and asked what impressed me most Was it the searching expression of the patient? 'Yes, Sister, it is,' I answered 'I happen to know that the patient is Jewish I believe he has just recognized the stranger looking over the doctor's shoulder, and he is asking the doctor 'How come we need in this case a consultant?''

I believe that many of the stories prepared by the medical hippophile are better stimulants and poorer sleep-inducers than a majority of Tonics and Sedatives

J H T

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1 Nierman M M Patients and Ponies, New York Random House, 1960

CITY WATER WORKS

New York, Boston, and Philadelphia established waterworks about 1800, and so, likewise, did several smaller New England and New Jersey towns Baltimore came into line by 1807 Only in Philadelphia was the water system a public one, though its example would eventually be followed in nearly all cities —R H Shryock, Medicine and Society in America, 1660-1860, N Y U Press, 1960, pages 102-103

CLINICAL NOTES

Primary Ureteral Carcinoma

Joseph R Oldford, M D and Maitland N Stewart M.D, Detroit

Primary ureteral tumors are uncommon or infrequent, but can no longer be considered the rare clinical entities they were formerly thought to be Improved diagnostic techniques and an awareness on the part of the physician are the most important factors contributing to the increased reports of primary ureteral tumors in the literature

A case of primary ureteral carcinoma will be presented, in addition to a brief review of the salient features of this disease entity

History and Nature

Rayer was the first to report a case, in 1842 In 1878, Wising and Blix confirmed their case by microscopic sections The first case diagnosed prior to surgery was credited to Albarran in 1902 Since that time, numerous cases have been collected from the literature The most extensive recent review of the literature was done by Abeshouse in 1956,[1] at which time he collected 197 cases and added 12 of his own This series, along with Mortenson's and Murphy's series, brought the total reported to that date to 454 Since that time, additional cases have been reported

The etiology is unknown, but several theories have been proposed, among them (1) bacterial infections, (2) obstructive uropathies, (3) calculous disease, (4) vitamin deficiencies, (5) hormonal imbalance, (6) toxic products of metabolism, and (7) specific carcinogens [2] All these factors react on the urothelium, producing histological changes which have been described as proliferative and metaplastic These changes predispose to tumor formation

The ages in most series range between 40 and 80 years, with a preponderance of cases in the fifth and sixth decades The ratio of male to female patients in cases reported is about 2 1 The lower one third of the ureter is the most prevalent site, and there is a slightly higher incidence in the left ureter

An excellent pathological classification is that of Whitlock, in which the tumors are divided into (1) papillary carcinoma, (2) papillary carcinoma and infiltrating, and (3) non-papillary carcinoma and infiltrating Histologically, these tumors are transitional cell carcinomas in type, as seen involving urothelium elsewhere in the urinary tract The three most prominent symptoms are hematuria, pain, and a palpable mass Other less common symptoms are frequency, urgency, burning, weight loss, fever, and chills

Diagnosis—The two most important diagnostic aids are cystoscopy and retrograde pyelo-ureterography Occasionally at cystoscopy, a tumor will be seen protruding from the ureteral orifice, such a tumor can be readily biopsied Occasionally, attempted manipulation of a "non-opaque calculus with a wire stone basket will yield tissue for histological study [3] In the case to be reported, the ureteral defect initially was interpreted as a non-opaque calculus, and attempted manipulation yielded tissue for biopsy

Ureteral catheterization may reveal obstruction at the site of the tumor, and the slightest manipulation may induce bleeding (Chevassu-Mock's sign) Subsequently, when the site of obstruction is passed, clear urine may be obtained (Marion's sign) [1]

With reference to roentgenographic studies, intravenous pyelography seldom is diagnostic Retrograde pyelo-ureterograms are the most important adjunct for diagnosis The characteristics of the ureterogram are (1) dilation of the ureter above and below the site of the obstruction, (2) defect in the ureterogram at the site of the tumor, and (3) evidence of hydronephrosis in approximately 15 per cent of cases

The differential diagnosis usually lies between non-opaque calculus, inflammatory mass, and neoplastic mass

Treatment—The treatment of choice is complete nephro-ureterectomy, if there is any chance for cure This consists of complete removal of the kidney and ureter as well as partial excision of a cuff of bladder There are certain factors that influence the choice of operation, namely, the general condition of the patient, the functional status of the opposite kidney, and the duration, location, and pathological type of tumor Burns, Davis, Foley, and Abeshouse [1] maintain that the only place for

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Resident (Dr Oldford) and Chief (Dr Stewart) Division of Urology Department of Surgery Grace Hospital

American Public Wasting Millions on 'Vitamania'

AMERICANS are squandering hundreds of millions of dollars each year on self-medication that is largely unnecessary. The average American family spends too much for non-prescription or over-the-counter products—virtually all of which bring little or no health benefit. In fact, the only real effects from most of this self-medication are psychological.

In other words, we have become a land of hypochondriacs. For a nation that prospers in the finest health in history and enjoys a greater life expectancy than any other era, our people have become obsessed with health.

E. Vincent Askey, M.D., President, American Medical Association

Open any newspaper or popular magazine and you'll find dozens of ads which are making hay from fanatical concern for the easy way to good health. Drugstores would not be the same without their shelves full of vitamin preparations, and the mail-order houses devote pages of their catalogues to such items. Even the grocery chain stores—the purveyors of the finest stock of natural vitamins that anybody could require—now begin to stock supplemental vitamin preparations.

Anyone who reads the popular media critically is astounded by the innumerable ads extolling the virtues and necessity of food supplements, tonics, reducing aids, exercise devices, "schools" for those who want to lose weight, books with preposterous fad diets, and so on.

Despite the excellent health we enjoy as a nation, America has contracted a new ailment—*Vitamania*. Ingenious advertising and misleading claims have helped to cram Americans full of vitamins—which they don't need.

I wonder how few Americans have been lucky enough to escape the attentions of the health salesman, the quack, the lecturer, the author, and the huckster. From all sides, Americans are bombarded with nutritional hogwash. If they don't read it in the newspapers, or have it peddled to them by door-to-door salesmen, they see it on television, hear it over the radio or learn about it from the neighbor who has suffered from arthritis for these many years but now has found relief from a mixture of powdered sulfur and molasses which she dissolves in her bath water every night.

Yes, Americans are told that they are undernourished, that they suffer from vitamin *deficiency*, and that their food is ruined before it ever reaches the supper table by poor soil, overprocessing, and cooking which removes all the nutritional goodies. Americans are told that any number of complaints *may* be caused by vitamin deficiency, but they are *not* told that these diseases and ailments rarely are caused in such a manner.

So many Americans have been brainwashed by the "depleted soil" and vitamin deficiency sales pitch that it is worth while quoting a report from the U. S. Food and Drug Administration:

"The American food supply is unsurpassed in volume, variety and nutritional value. By patronizing all departments of a modern food store, we can easily supply all of our nutritional needs. In fact, Americans have to go out of their way, nutritionally speaking, to avoid being well nourished. Deficiency diseases which have plagued our nation in the past are now almost unknown."

In other words, an American would have to bend over backwards to suffer from the "ailments" that the nutritional quacks claim are so widespread.

Of course, there is nothing wrong with vitamins. In fact, we couldn't live without them. What I object to is the manner in which they are sold and the false claims made for them.

Daily minimum vitamin and mineral requirements have been established, and yet it is a curious American belief that if so much of a vitamin is valuable, then twice as much is still more valuable.

As physicians we know that good health is really quite cheap. It is not found in bottles, boxes, organic fields, health food shops, or health clubs.

It can be had through a well-balanced diet, sufficient exercise, and moderate living.

E. Vincent Askey M.D.

ORGANIZATION SECTION

A M A FORMS NEW DEPARTMENT OF NURSING

The American Medical Association announced the formation of a new Department of Nursing to carry on liaison with national nursing organizations Veronica L Conley, Ph D, who for the past 12 years has served as secretary of A M A s Committee on Cosmetics was named director of the new department, which is a part of the association's Division of Scientific Activities Dr Conley holds a B A in biology from Boston University, M N from Yale University, and M A and Ph D, in education from the University of Chicago

In making the announcement, Dr F J L Blasingame, executive vice-president, said that Dr Conley will also serve as secretary to the Committee for Liaison with National Nursing Organizations This committee is headed by Dr Cleon Nafe, Indianapolis, a member of A M A 's Board of Trustees Committee members are Drs Clarence H Benage, Pittsburg, Kan, Elias S Faison, Charlotte, N C, Charles L Hudson, Cleveland, Arthur A Kirchner, Los Angeles, and Elmer P Weigel, Plainfield, N J Joseph B Jerome, Ph D, assistant to the secretary of A M A 's Council on Drugs, will serve as acting secretary of the Committee on Cosmetics replacing Dr Conley

C H WILLIAM RUHE JOINS AMA STAFF

Dr C H William Ruhe has been appointed Assistant Secretary in the Council on Medical Education and Hospitals Dr Ruhe will assume responsibility for the Council s activities in the area of continuing medical education He joined the Council s staff on Nov 1 At the time of his appointment to the Council's staff, Dr Ruhe was associate professor of physiology and pharmacology at the University of Pittsburgh School of Medicine, serving in that capacity since 1951 He held administrative posts at Pittsburgh as assistant dean, 1955-1959, and to the present as associate dean Dr Ruhe is the author or co-author of 16 scientific papers dealing principally with blood, blood volume, and hypothermia

GOVERNMENT SERVICES

AIR FORCE

In Space Cabin for 30 Days —Two Air Force pilots have completed the longest simulated-space cabin run ever conducted at the Air Force School of Aviation Medicine, Brooks Air Force Base, Texas They entered the 8- by 12-ft cabin Aug 15 and emerged 30 days, 8 hours and 21 minutes later The experiment was designed to test the reliability of component parts of the simulator and to obtain data relevant to manned space flight Both pilots volunteered and expressed a strong desire to participate in the event Both were pronounced physically and mentally qualified after extensive examinations at the School of Aviation Medicine

The 30 day experiment was anything but a picnic for them Unlike the two subjects in the 14-day run last February, they did not have commercial television or magazines for diversion, or time to enjoy these luxuries if they had been available In order to give them a realistic feeling of being detached from the world they knew and to test their reactions to this, all information about the outside world was kept to an absolute minimum The only reading materials they took into the cabin were two books of short stories, a Bible, and a book entitled *The Green and Red Planet A Physiological Study of the Possibility of Life on Mars*, by Dr Hubertus Strughold

Inside the cabin, the men maintained a demanding schedule The cabin s simulated flight-control panel had to be manned 22 hours a day, and the men alternated at this While one was on duty at the panel, the other would calibrate instruments, purify waste liquids to replenish the cabin water supply, eat, sleep, or take his turn at housekeeping

The flight control panel was developed and built at the School of Aviation Medicine A stress-performance–measuring apparatus helped scientists determine how isolation, confinement, and unique work-rest schedules affected the subjects reaction times and responses Every 90 minutes the pilots gave terse reports on the temperature, humidity, carbon-dioxide level, water-vapor percentage, and air pressure in the cabin Once a day they reported their blood pressure readings and their temperatures, which had been recorded hourly Each subject also spent two hours a day taking a test which registered his heart activity and respiration rate on recorders outside the cabin In addition, they made tests to check for any changes in their vision Twice a week they took blood samples for chemical analyses from each other and passed them out through the cabin's small airlock

Throughout the test they carefully noted and reported the amounts of food and water consumed and the amount of water produced In contrast to the previous run in which the subjects had their water replenished from outside the cabin, the pilots started with 22 gallons of fresh water which was maintained by recycling and purifying the subjects' body water within the cabin Waste material was disposed of by incineration and "jettisoning"

Personal—Dr Howard A Rusk was named by the Chief of Staff, United States Air Force, to fill an Air Force Reserve Mobilization assignment as Deputy for Reserve Affairs to the Air Force Surgeon General Dr Rusk, an Air Force Reserve brigadier general, will perform his annual training in the same assignment he would fill in the event of a national emergency ——Dr Lawrence E Lamb, Chief of the Consultation Services Division and Chief of Internal Medicine Branch at the Air Force School of Aviation Medicine, was awarded an outstanding-performance rating and $300 Last year Dr Lamb received the Dr Arnold D Tuttle Award from the Institute of Aeronautical Sciences The award is bestowed annually for achievement in aeromedical research and is accompanied by a bronze plaque and $500 In 1958 he received an outstanding-performance rating and $300 for important contributions to cardiology as applied to aviation medicine ——Dr Richard D Mudd was appointed a National Consultant in Occupational Medicine He served with the Army Air Corps from 1941 to 1946, during which time he received 13 citations During the Korean emergency, Dr Mudd served as Surgeon, Tenth Air Force, with headquarters at Selfridge Air Force Base, Michigan He also holds the Legion of Merit award

NAVY

Retirements—Captain Henry T Gannon, after more than 20 years of active naval service, retired in August His last assignment was Director, Office of Medical Service, Office of the Secretary of Defense, Washington, D C ——Captain David P Hightower retired after more than 20 years of active naval service His last assignment was at the U S Naval Academy, Annapolis, Md ——Captain Charles Gartenlaub retired after more than 19 years of active naval service He was last assigned to the U S Naval Hospital, St Albans, L I, N Y

Training in Submarine Medicine—A two-week course in submarine medicine will convene on Nov 7 at the U S Naval Medical Research Laboratory, U S Naval Submarine Base, New London, Conn This training will present an up-to-date review of problems relating to submarine medicine, including recent developments in submarine medicine research Quotas for this course have been allocated to the First, Third, Ninth, and Eleventh Naval Districts Naval Reserve Medical Corps officers of the above districts are eligible to request orders from their naval district commandant Clearance for secret information is required

Personal—Captain Earland E Hedblom, M C, was presented a Secretary of the Navy Letter of Commendation with Commendation Ribbon and Metal Pendant in recognition of outstanding performance of duty ——Captain George W Hyatt, after more than 16 years of active naval service, resigned his commission Sept 1, 1960, to become Professor of Surgery (Orthopedics) at Georgetown University, Washington, D C

PUBLIC HEALTH SERVICE

National Cancer Institute—Realignment of program operations for grant support of research and training, and for field studies, will be effected in the National Cancer Institute under two associate directors appointed on the staff of Dr Kenneth M Endicott, who became director on July 1 Dr Ralph G Meader, Chief of the Research Grants Branch since 1948, has been designated associate director for grants and training Dr Michael B Shimkin, Chief of the Biometry Branch since 1954, has been designated associate director for field studies

All of the Institute's grant and training activities will be administered in different branches under Dr Meader's direction He will have responsibility in particular for the expanding program of research on viruses as a possible cause of human cancer, currently supported under 155 grants totaling $5,600,000, and for comprehensive programs that may be authorized at designated research centers

Activities under Dr Shimkin's purview will include studies in biometry, epidemiology, environmental cancer, and diagnosis, including field investigations, which will be administered by several branches The reorganization will probably include the establishment of several new branches in the institute

Dr Stuart M Sessoms, who has supervised the institute's world-wide drug-development program since November, 1958, has also been given the title of associate director and will continue to head the Cancer Chemotherapy National Service Center Full responsibility for administration of clinical research at the National Cancer Institute in Bethesda has been assigned to Dr Charles G Zubrod as clinical director Dr Carl G Baker, Assistant Director, has been given responsibility for nonclinical research at the institute Dr Eli Nadel, formerly assistant to the associate director for intramural research of the National Institutes of Health, has been appointed an assistant director of the institute

Water Pollution —The second annual report of a long-range, continuous study of pollution in major interstate waters has been released The report presents data for the year ended Sept 30, 1959, assembled from 54 water-sampling stations which have been expanded to 75 Enlargement to 300 stations is planned Technically, the data serve to provide such information as How badly are our rivers polluted? Where do the pollutants come from? Of what are they composed? How have conditions changed since last year? Where can new industry best locate if it is to get a good quality of water?

Accurate answers to these and related questions are important in today's management of water resources Such knowledge is vital to the growing nation's health, economy, and welfare These facts must be recorded regularly and continuously to be useful to water works and sewage-treatment plant operators, state health agencies, municipalities, industries, and researchers seeking answers to water pollution problems

The National Water Quality Network is operated by the Public Health Service in co-operation with local agencies, supplemented by several hundred intrastate stream stations operated by the state and local agencies Samples collected weekly are analyzed for coliform bacteria which come from sewage, for aquatic organisms, radioactivity including strontium 90, synthetic organic chemicals, heavy metals usually originating from industrial wastes, and various other substances

Training Courses —Four national courses to train medical and health personnel for emergency services will be held during the current fiscal year by the U S Public Health Service and the Office of Civil and Defense Mobilization Three of the courses are being offered for the first time These will be for hospital administrators, registered nurses, and environmental health personnel The fourth is a repetition of basic health mobilization training for physicians and health-related professions which was introduced to the public last April, May, and June

All courses cover basic civil defense concepts current information on biological, chemical, and radiological welfare, and community disaster planning Emergency services training includes the setup and operation of a Civil Defense Emergency Hospital, treatment of water to make it safe for use decontamination of food and milk, mass casualty care, and medical self-help Tuition and housing are provided without cost to students, and about half of the necessary travel expenses can be reimbursed through OCDM student training expense funds Enrollments are limited Applications should be made through State Civil Defense Directors

Personal —Dr Thomas C Jones, pathologist at the Angell Memorial Animal Hospital, Boston, Mass, was appointed to serve a three-year term on the Pathology Training Committee of the National Institutes of Health As a member of the committee, Dr Jones will review applications for training grants in the field of pathology —Dr Ward S Fowler, consulting physician Mayo Clinic, and professor, Mayo Foundation, Rochester, Minn, was appointed to serve a three-year term on the Physiology Training Committee of the National Institutes of Health As a member of the committee he will review applications for training grants in the field of physiology —Dr Robert Dyar, Chief of the Division of Research, State Department of Public Health, Berkeley, Calif, was appointed to serve a four-year term as chairman of the Advisory Committee on Epidemiology and Biometry of the National Institutes of Health, U S Public Health Service —Dr L Edgar Lee, Jr, Executive Secretary of the Pathology Training Committee and the Experimental Training Grants Program of the Division of General Medical Sciences, National Institutes of Health, left NIH to become a research associate in the Department of Pathology at Yale University School of Medicine, New Haven, Conn He will teach and take specialized training in experimental pathology there

Metabolic Disease Team in Moscow —A team of five American scientists went to Moscow in September to survey the progress of metabolic-disease research in the Soviet Union The mission was sponsored by the National Institute of Arthritis and Metabolic Diseases It is part of the scientific-cultural exchange program under which Soviet scientists visited U S laboratories last February The team will remain in the U S S R for 18 days

Members of the U S mission are Dr Floyd S Daft, director of the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md, Dr William H Sebrell, Jr, director of the Institute of Nutrition Sciences, School of Public Health and Administrative Medicine, Columbia University, New York, Dr J Murray Luck, professor, department of biochemistry, Stanford University, Palo Alto, Calif, Dr Currier McEwen, associate professor of medicine, New York University College of Medicine, New York, and Dr Clifford J Barborka, associate professor of medicine, Northwestern University Medical School, Chicago

Visit of Russian Scientists —Five Russian scientists engaged in cancer research visited the National Cancer Institute at Bethesda, Md, in September They were here under an agreement between the United States and the U S S R for cooperation in exchanges in the scientific and cultural fields

DEATHS

Alberty, Watie Murrell, San Diego, Calif.; University of Kansas School of Medicine, Kansas City, Kan., 1917; served in the regular Navy and the Naval Reserve; veteran of World Wars I and II; for many years on the staff of the Mercy Hospital, where he died Aug. 5, aged 67, of pneumonia.

Bedenbaugh, James I., Newberry, S. C.; University of Georgia Medical Department, Augusta, 1903; for many years practiced in Prosperity, where he was a member of the town council and a member of the school board; died in Columbia June 8, aged 86, of cerebrovascular accident.

Beuker, Herman, Marshall, Mich.; Rush Medical College, Chicago, 1929; for many years on the staff of Oaklawn Hospital; died in the Paul Oliver Memorial Hospital, Frankfort, Aug. 7, aged 62, of acute myocardial infarction.

Blackmer, Loren Guy, Hooker, Okla.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; served on the staff of the Epworth Hospital in Liberal, Kan.; founder and chairman of the Hooker First National Bank; died Aug. 7, aged 79, of cerebrovascular accident.

Blume, Earnest, Jonesboro, La.; Fort Worth (Texas) School of Medicine, Medical Department of Fort Worth University, 1905; for many years coroner of Jackson Parish; died in Muskogee, Okla., July 23, aged 78, of pulmonary embolus.

Borders, Theodore Roosevelt Ⓜ Fort Wayne, Ind.; Howard University College of Medicine, Washington, D. C., 1930; on the staff of St. Joseph's Hospital; died in the Parkview Memorial Hospital Aug. 14, aged 58, of coronary thrombosis with myocardial infarction.

Brian, Earl Winfrey Ⓜ Raleigh, N. C.; born in Camden, Ark., April 9, 1907; Duke University School of Medicine, Durham, 1934; interned at the Henry Ford Hospital in Detroit and the Duke Hospital in Durham; served a residency at the Henry Ford Hospital in Detroit; since 1958 served on the state board of health; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past-president of the Wake County Medical Society; instrumental in the organization of the Wake County Cancer Society; active in the Heart Association and for 17 years a member of the board of the Wake County Tuberculosis Association; past-president of the Raleigh Kiwanis Club and of the Executives Club; selected as Raleigh's "Kiwanian of the Year" in 1957; in 1956-1957 was vice-president of the United Fund of Raleigh; a member of the board of directors of the Salvation Army and of the Occoneechee Boy Scout Council; member of the staffs of Rex, Mary Elizabeth, and St. Agnes hospitals; died in the Duke Hospital Aug. 1, aged 53, of chronic lymphocytic leukemia.

Budge, Wallace Hugh Ⓜ Ogden, Utah; Rush Medical College, Chicago, 1920; member of the American Academy of General Practice; veteran of World War I; on the staffs of the Thomas D. Dee Memorial and St. Benedicts hospitals; died Aug. 18, aged 71, of coronary artery disease.

Byrd, Jack Edward Ⓜ Commander, U. S. Navy, retired, Waycross, Ga.; Emory University School of Medicine, Atlanta, 1947; died in Guadalajara, Mexico, Aug. 13, aged 37.

Calderwood, William Robert Ⓜ Salt Lake City, Utah; born in Coalville April 12, 1866; Rush Medical College, Chicago, 1903; retired medical director of the Beneficial Life Insurance Company, of which he was a member of the board of directors; past-president of the Salt Lake County Medical Society, Utah State Medical Association, and the University of Utah Emeritus Club; one of the organizers of the Utah Mental Health Association; at one time instructor in physical diagnosis at the University of Utah College of Medicine; served as president of the staff of Latter Saints Hospital in Salt Lake City and on the governing board of the Utah State Hospital, Provo; died Aug. 7, aged 94, of arteriosclerotis heart disease and diabetes.

Chambers, John Swope Davis, Portland, Ore.; Columbia University College of Physicians and Surgeons, New York City, 1905; veteran of the Spanish-American War; formerly medical officer at Swan Island; died Aug. 17, aged 85, of coronary occlusion.

Cress, Walter William, Sacramento, Calif.; University of Illinois College of Medicine, Chicago, 1912; veteran of World War I; division surgeon of the Southern Pacific Company and head of the staff of the Southern Pacific Hospital; on the staffs of the Sutter and Mercy hospitals; died Aug. 13, aged 75, of arteriosclerotic heart disease.

Crews, Albert William, Fort Worth, Texas; College of Physicians and Surgeons, Baltimore, 1912; formerly practiced in Huntington, W. Va., where he was associated with St. Mary's Hospital; died Aug. 19, aged 79, of arteriosclerosis.

Ⓜ Indicates Member of the American Medical Association

Cruikshank, Dwight P, Lumberport, W Va , College of Physicians and Surgeons, Baltimore, 1902, at various times served as mayor, city recorder, and health officer, associated with St Mary's and Union Protestant hospitals in Clarksburg, died Aug 10, aged 85, of arteriosclerotic heart disease

Denig, Rudolf Carl Robert, Bayreuth, West Germany, Julius-Maximilians-Universitat Medizinische Fakultat, Wurzburg, Bavaria, Germany, 1890, served as professor of clinical ophthalmology at Columbia University College of Physicians and Surgeons, New York City, where he was associated with the Lenox Hill Hospital, died July 22, aged 92

Dyer, Royal Homer, Sheridan, Mont , St Louis University School of Medicine, 1907, formerly practiced in Marshall, Mo , mayor of Sheridan for three terms, a surgeon for the Northern Pacific Railway, and school physician, for many years health officer of Madison County, on the staff of the Community Memorial Hospital in Butte and the Sheridan Hospital, died Aug 16, aged 78, of arteriosclerosis

Earnest, Albert Nila Ⓜ Muskogee, Okla , Memphis (Tenn) Hospital Medical College, 1913, veteran of World War I, associated with the Muskogee General and Oklahoma Baptist hospitals, died July 27, aged 69, of arteriosclerotic heart disease

Eberhard, Theodore Philip, Ann Arbor, Mich , born in Akron, Ohio, Aug 1, 1904, Western Reserve University School of Medicine, Cleveland, 1930, formerly an intern at Lakeside Hospital in Cleveland and the New England Deaconess Hospital in Boston, served as resident at the Pondville Hospital in Wrentham, Mass , and the Presbyterian Hospital in New York City, at one time medical director and radiologist of the Ellis Fischel State Cancer Hospital in Columbia, Mo , on the staff of St Joseph Mercy Hospital, served on the faculty of the Jefferson Medical College in Philadelphia, specialist certified by the American Board of Radiology, member of the Radiological Society of North America, American College of Radiology, and the American Radium Society, member of the advisory committee to Michigan State Health Commissioner on Radiation Protection, veteran of World War II, died in Pointe du Baril Island, Ont , Canada, Aug 14, aged 56, of coronary occlusion

Edlin, Jacob Vernon, Palm Beach, Fla , Tufts College Medical School, Boston, 1922, formerly superintendent of the Chicago State Hospital, died in Lake Worth Aug 19, aged 65, of arteriosclerotic heart disease

Fine, Isidor, Brooklyn, Eclectic Medical College, Cincinnati, 1928, member of the American Psychiatric Association and the Association of Nervous and Mental Diseases, formerly a pharmacist, an examining psychiatrist for the Domestic Relations Court of Kings County and for the Army during World War II, served on the staff of the Kings County Hospital and of the Jewish Hospital, where he died Aug 19, aged 65, of cardiovascular accident

Fine, Nathaniel Jacob, Indianapolis, Laval University Faculty of Medicine, Quebec, Que , Canada, 1942, veteran of World War II, regional medical officer of the Southwestern Region of the Pennsylvania Railroad, died Aug 5, aged 44, of acute myocardial infarction

Frogner, Guy Samuel Ⓜ Thompson Falls, Mont , College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911, veteran of World War I, died in Missoula Aug 8, aged 74, of coronary occlusion

Gouterman, Joseph Isadore Ⓜ Philadelphia, Temple University School of Medicine, Philadelphia, 1919, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, veteran of World War II, associated with the Wills Eye Hospital and the Graduate Hospital of the University of Pennsylvania, died in the University Hospital Aug 9, aged 66, of acute myocardial infarction

Grady, Patrick Anthony Salmon, Clinton, Mass , Baltimore Medical College, 1897, associated with the Clinton (Mass) Hospital, died Aug 12, aged 86, of arteriosclerotic heart disease

Greene, Ralph James, Perry, Fla , Atlanta Medical College, 1914, veteran of World War I, a director of the Florida National Bank of Perry, died Aug 3, aged 72, of myocardial infarction

Gutmann, Selmar, New York City, Universitat Heidelberg Medizinische Fakultat, Baden, Germany, 1911, served on the staff of Lenox Hill Hospital, died in Glenham, N Y , Aug 17, aged 74, of a heart attack

Heilman, Fordyce Russell, Rochester, Minn , born in Austin June 16, 1905, Northwestern University Medical School, Chicago, 1931, interned at St Luke's Hospital, in Chicago, where he served as resident physician, came to Rochester on July 1 1932, as a fellow in surgery of the Mayo Foundation, his graduate studies included a considerable amount of work in bacteriology and experimental bacteriology, on April 1, 1935, was appointed a first assistant in experimental bacteriology in the Mayo Foundation, in 1938 received the degree of master of science in bacteriology from the University of Minnesota and in 1940 he received the degree of doctor of philosophy in bacteriology, was appointed to the staff of the clinic on April, 1939, as a consultant in what was then the section of bacteriology and parasitology, became head of this section in 1944, the name was changed to the section of experimental bacteriology on Jan 1, 1945 and since Oct 1, 1947, it was known as the section of bacteriology, appointed instructor in bacteriology in the Mayo Foundation Graduate School, University of Minnesota, in 1939 and was advanced to assistant professor in 1941, associate professor in 1945 and professor in 1946, early in his career at the clinic carried out laboratory studies upon polioencephalitis and myasthenia gravis, subsequently became known for his work on the chemotherapy of infectious diseases, was made a charter fellow of the American Academy of Microbiology in 1957 in recognition of his position as "distinguished in the field of microbiology, with wide training and experience", in 1953, with two other clinic physicians, received the first annual B B Vincent Lyon Award of the American Gastroenterological Association for a paper on micrococcic (staphylococcic) enteritis after the use of oxytetracycline, fellow of the American Public Health Association, Society of American Bacteriologists, American Association for the Advancement of Science, the American Society of Clinical Pathologists, the American Association for Cancer Research, the Society for Experimental Biology and Medicine, the Society for General Microbiology, the New York Academy of Sciences, the Society of the Sigma Xi, the Alpha Omega Alpha honor society, and the Phi Rho Sigma professional medical fraternity, died Aug 15 aged 55

Helm, Karl Gaither, Alamo, Texas, Indiana University School of Medicine, Indianapolis, 1938, interned at the Columbia Hospital in Milwaukee, died March 8, aged 56, of right bundle branch block

Houston, William Henry, Colquitt, Ga , Atlanta School of Medicine, 1908, died in the Worth County Hospital in Sylvester Aug 9, aged 73, of congestive heart disease

Huston, James Mallernee Ⓜ Los Angeles, University of Cincinnati College of Medicine, 1921, specialist certified by the American Board of Otolaryngology, member of the American Academy of Ophthalmology and Otolaryngology, died July 15 aged 65

Keller, Joseph P , Nashville, Tenn , University of Nashville Medical Department, 1904, served on the faculty of his alma mater, associated with St Thomas and Nashville General hospitals, one of the founders and from 1931 to 1942 president of the staff of Protestant Hospital now known as the Baptist Hospital, died Aug 10, aged 85, of acute pulmonary edema

Kitsmiller, Clyd Ray, Cincinnati, Eclectic Medical Institute, Cincinnati, 1894, veteran of World War I, associated with the Veterans Administration, died in the Christ Hospital July 27, aged 88, of cerebral thrombosis

Klein, Harry Abraham Los Angeles, Chicago Medical School, 1928, died June 20, aged 64, of a heart attack

Leary, Olga Cushing, Boston, Tufts College Medical School, Boston, 1900, specialist certified by the American Board of Pathology, member of the College of American Pathologists and the American Society of Clinical Pathologists, served on the faculty of her alma mater, on the staffs of the Whidden Memorial Hospital in Everett, Winthrop (Mass) Community Hospital, Somerville (Mass) Hospital, and the New England Hospital, died in the Massachusetts Memorial Hospital Aug 5, aged 82, of arteriosclerotic cardiovascular disease

Levine, Arnold Sidney, Philadelphia, born in Trenton, N J , April 17, 1912 Jefferson Medical College of Philadelphia, 1937, specialist certified by the American Board of Psychiatry and Neurology, member of the American Academy of Neurology and the American Psychiatric Association, assistant professor of clinical neurology at his alma mater, veteran of World War II, associated with the Dufur Hospital, Ambler, Pa , Kensington (Pa) Hospital, Philadelphia Psychiatric Hospital, and the Albert Einstein Medical Center, died while on vacation in Quebec, Que , Aug 23, aged 48, of coronary artery thrombosis

Lobedan, Emil T Ⓜ Milwaukee, Wisconsin College of Physicians and Surgeons, Milwaukee, 1911, assistant chief of the child welfare division of the city health department died in the Milwaukee County Hospital, Wauwatosa, July 15, aged 80, of bilateral bronchopneumonia

Magee, Michael D'Arcy, Alexandria, Va , Georgetown University School of Medicine, Washington, D C , 1896, formerly taught at his alma mater, at one time associated with the Georgetown, Garfield, and Providence hospitals in Washington, D C , died in the Alexandria Hospital Aug 19, aged 89, of uremia

McBrean, George Martin Ⓜ Chicago, the Hahnemann Medical College and Hospital, Chicago, 1899, served on the faculty of his alma mater, specialist certified by the American Board of Ophthalmology, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, died in the Woodlawn Hospital Aug 27, aged 85, of myocardial infarction and arteriosclerosis

McCarn, Oscar Clarence Jr Ⓜ Birmingham, Ala , Tulane University School of Medicine, New Orleans, 1940, interned at the Norwood Hospital, where he served a residency, veteran of World War II, instructor in clinical medicine at the Medical College of Alabama, associated with the Carraway Methodist Hospital, died Aug 7, aged 48 of bacteremic shock and monocytic leukemia

McLaurin, Robert Torrey Ⓜ Laurel, Miss, Medical College of Virginia, Richmond, 1928, medical director of the Laurel General Hospital, died in Jackson Aug 18, aged 59, as the result of a cardiac operation

Millard, Frank Avery, Windsor, Ont Canada, Detroit College of Medicine, 1902, for many years with the Windsor branch of the Parke, Davis & Company, died July 31, aged 79, of uremia

Mills, Lloyd Ⓜ Rancho Santa Fe, Calif, Harvard Medical School, Boston, 1902, specialist certified by the American Board of Ophthalmology, member of the Association for Research in Ophthalmology fellow of the American College of Surgeons, served on the staffs of the Orthopaedic Hospital and the Hospital of the Good Samaritan in Los Angeles, died Aug 12, aged 80, of cerebral hemorrhage

Moak, Peter Harris, St Petersburg, Fla, Albany (N Y) Medical College, 1899, at one time practiced in Brooklyn, died Aug 6, aged 84 of arteriosclerotic heart disease

Morgenstern, Adolf Friedrich Ⓜ Cincinnati, Ernst-Moritz-Arndt Universitat Greifswald Medizinische Fakultat, Greifswald, Prussia, Germany, 1893, died in the Deaconess Hospital July 30, aged 91, of myocardial degeneration

Morrow, Hamilton Nesbit, Fremont, Neb, Rush Medical College, Chicago, 1901, past-president of the Dodge County Medical Society and Elkhorn Valley Medical Society, formerly a health officer, served on the school board, died Aug 9, aged 85, of peptic ulcer and arteriosclerotic cardiovascular disease

Neal, William Bartle Ⓜ Eugene, Ore, Northwestern University Medical School, Chicago, 1912, fellow of the American College of Surgeons, for many years district surgeon for the Southern Pacific Company, co founder of the Eugene Hospital and Clinic, where he died Aug 7, aged 76, of coronary thrombosis

Pitts, Herman Canfield Ⓜ Providence, R I, Yale University School of Medicine, New Haven, Conn, 1900, specialist certified by the American Board of Surgery, fellow of the American College of Surgeons, served as president of the American Society for the Control of Cancer, Rhode Island Cancer Society, and the Rhode Island Medical Society, veteran of World War I, on the staff of the Rhode Island Hospital, died Aug 5, aged 84, of injuries received in a fall

Riemann, Frederick Aloysius Ⓜ Parkesburg, Pa Hahnemann Medical College and Hospital of Philadelphia, 1932, interned at the Hahnemann Medical College and Hospital, veteran of World War II, associated with the Coatesville (Pa) Hospital, died at his summer home in Ocean City, N J, July 30, aged 52, of coronary thrombosis

Ritter, Adolph, Jr, Yemassee, S C, Medical College of South Carolina, Charleston, 1928, also a graduate in pharmacy, associated with the Ridgeland Hospital in Ridgeland, died Aug 2, aged 66, of acute myocardial insufficiency

Roberts, Albert W, Sevierville, Tenn (licensed in Tennessee in 1909), died July 6, aged 82, of acute coronary occlusion

Roden, Jacob Sylvester, Columbia, Mo, University of Texas School of Medicine, Galveston, 1945, interned at the University Hospitals in Iowa City and served a residency in obstetrics at the University of Virginia Hospital in Charlottesville, fellow of the American College of Surgeons, past-president of the West Texas Obstetricians and Gynecologists Society, professor and chairman of the department of obstetrics and gynecology at the University of Missouri School of Medicine, formerly on the staff of the Midland (Texas) Memorial Hospital, died July 26, aged 42, of coronary occlusion

Rothmann-Goldstein, Eva, New York City, Friedrich-Wilhelms-Universitat Mediziniche Fakultat, Berlin, Prussia, Germany, 1927, member of the American Psychiatric Association, died July 20, aged 62, of myocardial infarction

Rummell, Robert Jefferson Ⓜ Livermore, Calif University of Pennsylvania School of Medicine, Philadelphia, 1922, died July 6, aged 62, of acute myocardial infarction

Russell, Reister Kephart Ⓜ Bradford, Pa, Hahnemann Medical College and Hospital of Philadelphia, 1899, associated with the Bradford Hospital, where he died July 30, aged 83, of uremia due to essential hypertension

Schwertman, Arthur John Ⓜ Covington, Ky, University of Cincinnati College of Medicine, 1925, member and past-president of the staff, St Elizabeth Hospital, where he died July 23, aged 66

Shaffer, Joseph Wright Ⓜ Harrisburg, Pa, Medico-Chirurgical College of Philadelphia, 1912, on the staff of the Harrisburg Hospital, died July 22, aged 81, of leukemia

Shander, Michael, New York City, New York Homeopathic Medical College and Flower Hospital, New York City, 1913, died in the Mount Sinai Hospital July 8, aged 70, of basilar artery insufficiency and generalized arteriosclerosis

Shaw, Wilfred McLaurin Ⓜ Jacksonville, Fla, Jefferson Medical College of Philadelphia, 1919, specialist certified by the American Board of Radiology, member of the American Roentgen Ray Society, past-president, vice-president, and secretary of the Florida Radiological Society, past-president of the Duval County Medical Society, died in the Baptist Hospital July 23, aged 67, of *pneumonia due to Proteus vulgaris*

Simon, John, Napoleon, N D, Chicago College of Medicine and Surgery, 1909, veteran of World War I, served as county coroner and county health officer, died in the Veterans Administration Hospital, Fargo, July 31, aged 85, of metastatic carcinoma

Sims, William Bailey, Washington, D C, University of Virginia School of Medicine, Charlottesville, 1919, died in the Halifax Community Hospital in South Boston, Va, July 29, aged 66, of acute infarction of the brain

Smith, Robert Harlie, Mahomet, Ill, University of Illinois College of Medicine, Chicago, 1930, fellow of the American College of Surgeons, past-president of the Champaign County Medical Society, served on the village board and school board, for many years president of the Champaign County Tuberculosis Association, past-president of the staff of the Burnham City Hospital in Champaign and on the staff of the Mercy Hospital in Urbana, died Aug 1, aged 57, of coronary occlusion

Snider, James Tully, Burlington, Iowa, Chicago Medical School, 1923, died in Quincy, Ill, Aug 6, aged 71, of coronary heart disease

Socall, Charles J, Detroit, University of Michigan Medical School, Ann Arbor, 1930, veteran of World War II, died in Gaylord, Mich, July 3, aged 56, of coronary thrombosis

Sorock, Emil Maurice, Woodmere, N Y, Yale University School of Medicine, New Haven, Conn, 1908, formerly practiced in Detroit, where he was on the staff of the Grace Hospital, died in St Joseph Hospital, Far Rockaway, Aug 7, aged 82, of cerebral thrombosis

Stewart, Herbert Burns Ⓜ Morganfield, Ky, Kentucky University Medical Department, Louisville, 1904, honorary staff member, Our Lady of Mercy Hospital, where he died July 31, aged 87, of gastrointestinal hemorrhage and uremia

Suino, John Baptist Ⓜ Peoria, Ill, Chicago Medical School, 1933, veteran of World War II, medical director of the American Red Cross Center, died in St Francis Hospital July 29, aged 57, of metastatic carcinoma of the left leg

Tamiesie, George William, Portland, Ore, University of Oregon Medical School, Portland, 1902, on the staff of St Vincent's Hospital, died July 29, aged 85, of coronary thrombosis

Taylor, Byron Hawthorne, Jr Ⓜ Fredericktown, Mo, University of Tennessee College of Medicine, Memphis, 1945, interned at the Philadelphia General Hospital, served a residency at St Luke's Hospital in St Louis, veteran of World War II, died July 29, aged 39, of asphyxia due to aspiration of stomach contents

Wallace, Victor George Henry, Farmington, Conn, University of Edinburgh Faculty of Medicine, Scotland, 1926, veteran of World Wars I and II, served as medical director of the state department of welfare and of the Connecticut Regional Blood Center of the American Red Cross, specialist certified by the American Board of Obstetrics and Gynecology, formerly associated with the Norwalk (Conn) General Hospital, Hartford (Conn) Hospital, and St Joseph and Stamford hospitals in Stamford, died in Tours, France, July 24, aged 63, of coronary occlusion

Ward, Edwin Janvier, Baltimore, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1921, died in the Mercy Hospital July 26, aged 66, of cerebral hemorrhage

Warren, Edward William, Ithaca, N Y, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1931, veteran of World War II, died Aug 4, aged 57, of hypertensive cardio vascular renal disease

Watkins, William Larkin, Alpena, Ark (licensed in Arkansas in 1903), died in the Boone County Hospital, Harrison, July 31, aged 82, of cerebral hemorrhage

Wentworth, Caroline Young, Newton Center, Mass, Boston University School of Medicine, 1895, for 50 years attending physician at the Stone Institute for Aged, died Aug 6, aged 95, of cerebral arteriosclerosis

Whitten, Samuel David, Greenville, Texas, Fort Worth School of Medicine, Medical Department of Texas Christian University, 1913, served as health officer of Hunt County, formerly vice-president of the State Medical Association of Texas, died in Dallas July 22, aged 74, of diabetes

York, Orphus, Panhandle, Texas, St Louis College of Physicians and Surgeons, 1904, medical examiner for the Carson County draft boards during World Wars I and II, for many years county health officer, died in Amarillo July 16, aged 85, of lymphocytic leukemia

Zurcher, Clarence Henry, Louisville, Ky, University of Louisville School of Medicine, 1931, died in the Norton Memorial Infirmary July 21, aged 54, of acute diabetes nephrosis, and massive atlectasis of left lung

FOREIGN LETTERS

BRAZIL

Hemorrhage of the Upper Digestive Tract—Dr Silva Bastos and co-workers of the University of São Paulo (*Rev Hosp Clin*) analyzed a series of 316 patients who had massive gastrointestinal hemorrhage As a result of their study they concluded that the patient should be hospitalized and kept at absolute bedrest A blood cell count should be made, the blood type determined, and a transfusion started as soon as possible The pulse rate and blood pressure should be checked every 30 to 60 minutes and recorded on a graph

As soon as the emergency measures have been accomplished, feeding should be started If the patient is nauseated or has a sense of fullness only iced milk should be given The principle of frequent small feedings should be applied It may be necessary to ligate intraesophageal varices Patients with portal hypertension may require a splenorenal or portacaval anastomosis The indications for surgical interference are reinforced when the hemorrhages are recurrent If the patient is more than 45 years of age, operation should be performed even while the patient is still bleeding

Cancer in Native Indians—A M Bellizzi (*J Brasil Med* [June] 1960) investigated the causes of death among the Brazilian Indians The most frequent of these was diarrhea Neoplastic tumors were not found in any of the persons examined, and no indications of cancer were found in any of the autopsies

CANADA

Renal Transplantation Between Identical Twins—Hitherto, the only surgical team that has performed successful renal transplantation between identical twins has been that of Merrill and associates at the Peter Bent Brigham Hospital Dossetor and co workers now (*Lancet* 2 572, 1960) report a successful transplantation at the Royal Victoria Hospital Montreal Owing to the possibility of the homograft reaction, proof of identity was necessary Successful skin grafting between the twins, who were girls of 15, showed that they were monozygotic One of the twins had hypertension and papilledema, secondary to pyelonephritis After legal sanction was obtained, it was decided to transplant a kidney from the healthy twin During a six-and-one-half-week preoperative period the blood pressure of the recipient twin was brought under control with reserpine and hydralazine, and endogenous protein was reduced with testosterone dipropionate

One of the kidneys of the healthy twin, with attached ureter, was transplanted into the pelvis of the recipient and a ureterovesical anastomosis performed The blood vessels of the transplanted kidney were anastomosed with the right internal iliac artery and the right common and external iliac veins The operation took an hour Such a period of ischemia did not result in loss of function of the transplanted kidney The diseased kidneys were removed from the recipient twin in a subsequent operation five months later after it had been shown that the transplanted kidney was functioning

The initially severe hypertension was much improved after the transplantation, and the blood pressure reverted to normal after both diseased kidneys had been removed The patient was still alive one year after the operation, with a normal creatinine clearance and phenolsulfonphthalein excretion

DENMARK

Painless Cholestasis—Deckert and Wieth (*Nord Med*, July 28, 1960) define painless cholestasis as a syndrome consisting of jaundice with biochemical evidence of obstruction without any signs of parenchymatous damage and no history of typical pain In a series of 307 patients with jaundice, they found 67 to have painless cholestasis These patients were classified as surgical or medical This distinction was admittedly arbitrary, and jaundice due to mechanical obstruction of the hepatic or common bile duct qualified the patient for inclusion in the surgical class Many of the patients ultimately classed as those suffering from painless cholestasis were so classified only after due consideration had been given to history, epidemiological data, and clinical, biochemical, and roentgenologic examinations

In the choice of treatment, bilirubin tests may prove helpful after an observation period of two to four weeks If the serum-bilirubin concentration falls during this period to less than half the maximum value, laparotomy is not necessary If the bilirubin concentration rises or shows a smaller fall exploratory laparotomy is indicated

Blocking of the Pudendal Nerve—At the Maternity Department of the St Joseph's Hospital, transvaginal blocking of the pudendal nerve was used on 148 primiparas and 34 multiparas According to Dr N Hahnemann (*Ugeskr Laeg*, July 28, 1960), this procedure was tested mainly on primiparas because their reactions would be relatively uniform and so

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The items in these letters are contributed by regular correspondents in the various foreign countries

would help to show to what extent the procedure was reliable The reason why the multiparas did not fare as well as the primiparas was that the former belonged largely to the first series of women thus treated at a stage when the technique had not yet been perfected

The efficacy of the procedure was tested by pinpricks of the perineum, by the degree of sphincter relaxation, and by the patient's reaction to sutures The blocking was effected by a one per cent solution of lidocaine to which epinephrine had been added, and this was supplemented in some patients by the inhalation of trichloroethylene The first 90 patients thus treated did not fare so well as the last 92 for whom it could be claimed that the results were good in 74 (80 4 per cent), moderately good in 11 (12 per cent), and poor in 8 (8 6 per cent) Among the last 50 patients there was only 1 in whom the result was poor In no case were the results achieved marred by any complication such as infection, hematoma, rifts, hemorrhages, or infant mortality

The influence of this procedure on labor pains was hard to gauge It can be used in conjunction with forceps delivery but not with intrauterine operations It can prove to be disappointing when the patient is nervous and frightened, and it is contraindicated when the amniotic fluid is infected Idiosyncrasy to local anesthetics is also a contraindication One virtue of this procedure is that it can serve as a substitute for general anesthesia with all its concomitant discomforts such as vomiting

Reserpine for Chronic Chorea—Dr E Brandrup (*Nord Med*, Aug 4, 1960) treated seven men and one woman who had had chronic chorea for 2 to 20 years with reserpine or tetrabenazine Most of these patients had been treated with chlorpromazine on account of their psychic ailments without achieving appreciable relief from their choreic movements

Of the seven treated with reserpine, four showed definite improvement in muscular control as well as objective and subjective psychic improvement Of the two patients given tetrabenazine alone or in conjunction with reserpine, one showed improvement With both drugs it was noted that, when the reaction to them was good, this was so within a fortnight of the first administration This treatment was continued for from 2 to 30 months No disturbing side effects were noted

GERMANY

Pulmonary Cysts—J Hoferichter (*Deutsche med Wchnschr* 85 258, 1960) stated that cystic diseases of the lung can now be diagnosed early and treated definitively without much risk Primarily, they are benign Genuine pulmonary cysts develop with the branching of the bronchial tree in the third to fifth embryonal months When they are not related with the bronchial tree, they will not change their size and are of no clinical interest, but even a small connection between cyst and bronchial tree leads to valvular occlusion, and the cyst increases in size and may greatly displace lung tissue or the mediastinum Large intrapulmonary cysts usually have so large a connecting lumen that common respiratory infections lead to infection of the cyst, too The cyst is always situated tangentially to the bronchus and expectoration of its contents largely depends on the posture of the body

The first complications of the condition almost always occur in adolescence in the form of chronic or recurrent bronchitis or relapsing bronchopneumonia The diagnosis can be cleared only by x-ray examination Acute infection can be cured by drainage, aspiration, and antibiotic treatment This causes the dyspnea to subside and the cyst to return to its previous size, but one should not be satisfied with this result, since any recurrent infection will again involve the cyst

Diagnosis of a pulmonary cyst is by no means always easy, especially when marked perifocal pulmonary reactions are present In such cases the diagnosis can be established only by continued observation Every pulmonary shadow of undefined origin is an indication for a bronchoscopy or bronchography Small bronchi leading to the cyst are often detected only when hemorrhage occurs and the origin of the bleeding can be observed Direct puncture of the cyst is not advisable since it may be followed by an infection of the pleural space

Of 20 patients observed, 7 had been in tuberculosis centers for several years because their condition had been mistaken for pulmonary tuberculosis Pseudocysts developing in adolescents after pulmonary inflammation can be diagnosed by continued observation The roentgenographic changes usually regress without treatment, and these cysts are notable for the absence of bronchial structures in their walls

The treatment of choice for pulmonary cysts is segmental resection or lobectomy It is not necessary to limit the indication for operation since it is not a major one and a postoperative course of several weeks can be advantageously compared with years of conservative treatment Absolute surgical indications are secondary infections and acute symptoms of tissue displacement by an expanding cyst The normal contraindications to pulmonary resection are valid also in patients with this lesion

Epidemic Hepatitis—H Schon and co workers (*Deutsche med Wchnschr* 85 265, 1960) reported that the differential diagnosis of the various forms of icterus has been facilitated by enzyme examinations that aid in differentiating hepatitis from obstructive icterus The possibilities of enzyme examinations in anicteric hepatitis, e g, determination of glutamic acid-pyroracemic acid aminopherase, glutamic acid-oxalic acetic-acid aminopherase, sorbic dehydrogenase, and lactic dehydrogenase, are not yet well known Anicteric hepatitis is especially common in children and, if not recognized, may lead to chronic hepatitis and eventually hepatic cirrhosis

In a hepatitis epidemic involving 166 patients the diagnosis was established by enzyme examinations The total bilirubin level was above 1 2 mg % in only 22 patients All others were anicteric or, at the most, had a barely perceptible scleral icterus The diagnosis was made only by determining the glutamic-pyroracemic aminopherase In many patients symptoms consisted of no more than vomiting on one occasion, dyspeptic complaints, and anorexia for a short while The children felt well again after several days In the serum flocculation test, thymol turbidity showed some specificity at the beginning of the disease The Takata reaction was not indicative in most of the mild or moderately severe cases

INDIA

Psoralen for Vitiligo—A K Roy Chodbury (*Indian M J* 54 121 [June] 1960) administered pure psoralen extract, with or without ultraviolet radiation to the patches, to nine patients who had vitiligo and one who had dermal leishmaniasis with extensive hypopigmented patches The dosage of psoralen varied from 1 to 15 mg daily for a few months to four years, intermittently This dosage was well tolerated Pigmentation in the affected areas was noticeable within ten days to a month after the treatment was started and was most apparent over the face, neck, and hands and least so over the legs

The response was most striking in acute cases with multiple small hypopigmented spots None of the patients developed new spots or showed a relapse while on treatment, but some relapsed after the treatment was stopped These responded to further treatment The progress of pigmentation was rapid in the initial period, but later it gradually slowed down It could again be accelerated by exposure to ultraviolet rays Along with pigmentation reappearing in the depigmented patches, a generalized tanning of the body was also noticed

The process of pigmentation occurred in four different ways general tanning of the patch, hyperpigmentation at the margin of the patch, the process gradually spreading from the periphery to the center, appearance of pigmented spots in the patch, which gradually increased in size, or pigmentation around hair follicles Pigmentation was seen to occur even in covered areas of the body, and the author believes that the drug has both a central and a local action in producing melanogenesis The central action would explain the occurrence of generalized tanning

An associated increase in weight was seen with the oral administration of psoralen, and the action of the drug could be linked with pituitary activity leading to a central stimulation of melanocytic activity as well as increase in weight The patient with dermal leishmaniasis was unaffected by the drug, although diffuse pigmentation all over the body was noticed

Kwashiorkor—Bharucha and Edibam (*Indian J Child Health* 9 261 [June] 1960) studied the effects and comparative value of a vegetable protein diet alone and a similar diet fortified with a preparation containing 90 per cent milk protein in patients with kwashiorkor Alternate patients in a group of 22 children suffering from this disease were given a pure pulse diet and the rest pulse diet fortified with milk protein When milk protein was given, it formed 20 per cent of the total protein

The effectiveness of the diet was judged by the disappearance of diarrhea, recession of edema and skin changes, return of appetite, disappearance of apathy and irritability, improvement in the liver biopsy findings, increase in the erythrocyte count, hemoglobin changes in plasma electrolytes, and changes in plasma proteins Diarrhea and edema cleared up with almost the same rapidity in the two groups, within two weeks of starting treatment Scaling and erythema disappeared rapidly with both diets, but pigmentation took longer to disappear The total plasma proteins showed an increase in both groups The rise was greater in the group receiving the pulse diet alone The average increase in serum albumin, however, was higher in the group receiving milk protein while the globulin content was raised more in those taking the pulse diet The alpha-1 globulin level was reduced in the children receiving only vegetable protein and the alpha-2 globulin level was raised Those on the milk protein showed an increase in all globulin fractions except the alpha-2, which was reduced The gamma globulin level showed a greater drop in those taking vegetable proteins only The blood urea values were low and rose with treatment The average rise was twice as great in patients receiving milk protein, indicating higher nitrogen retention in these patients Muscle biopsy specimens showed hyalinization with or without hemorrhage

The authors concluded that the higher rise in serum albumin with milk protein *supplement* is probably due to the higher amino acid content, while the sharper decrease in gamma globulin with pulse diet alone would indicate a more satisfactory improvement in liver function Clinical improvement and recession in liver biopsy picture were comparable in both groups

Hydrops and Fetal Ascites—C Sarma (*Antiseptic* 57 455 [June] 1960) reported a series of 60 infants with fetal ascites He found that in South India, Rh incompatibility is rare, and most of the infants with fetal ascites did not have erythroblastosis Autopsy was necessary to arrive at a correct diagnosis as unexpected conditions might be present

In one infant the distention was due to a distended megacolon, and in another it was due to congenital bilateral hydronephrosis, hydroureters, and a full bladder The average weight of the fetus was 4 8 lb (2,041 2 Gm) Premature labor was common Ten of the mothers had polyhydramnios, antepartum hemorrhage occurred in seven, preeclamptic toxemia was present in three, and postpartum eclampsia was present in one One mother was severely anemic The association of polyhydramnios was significant, and presence of this should prompt a further investigation of the condition of the fetus About 25 per cent required some obstetric help to deliver an abnormal child Of 37 infants who were born alive, 16 died within the first few days, 23 infants were born dead The infant mortality was therefore over 65 per cent

INDIA

Alopecia Areata—A K Awachat and co-workers (*Indian J Derm & Venereol* 26 59 [April-June] 1960) used methoxsalen and ultraviolet rays to treat 42 patients who had alopecia areata This treatment was based on the concept that trophoneurotic disturbances cause alopecia areata and vitiligo and the promising results obtained with this treatment in patients with the latter condition The treatment for alopecia areata consisted of daily application at bedtime of undiluted methoxsalen solution to the bald patches, followed the next morning on alternate days by exposure to a suberythema dose of ultraviolet rays One to four methoxsalen tablets a day and biweekly injections of liver extract and vitamin B complex were also given

None of the patients in this series had a family history of alopecia areata or vitiligo Toxic effects from the use of methoxsalen were observed in 13 patients These effects included anorexia, giddiness, burning sensation, headache, irritation, and sleeplessness Of the 42 patients, 28 were considered cured following this treatment The first improvement was noticed after about four weeks of treatment About three months were required for complete cure

JAPAN

Syphilis from a Donor—A woman undergoing an operation received a blood transfusion Three weeks later she developed a visual disturbance and other symptoms suggestive of syphilis A complement-fixation test confirmed the diagnosis The patient sued the hospital and the surgeon for malpractice and was awarded a judgment The defendants appealed to a higher court, contending that at the time of the transfusion the donor reacted negatively to the serological test and other examinations, and all the due care and caution expected of them in such a case were exercised Nevertheless, the court ruled that they were negligent in that they omitted a personal interview and careful questionings which should have disqualified the donor The judgment of the lower court, therefore, was upheld, and the defendants were ordered to pay the full amount of damage asked and the court costs

Hereditary Black Hemoglobin—In a farming town a colony of 11 families includes a group of people whose lips are deep purple and whose entire body surfaces resemble those of patients with cardiac decompensation in the terminal stages The nasal and buccal mucosa are also deep purple Dr Tamura of Iwate Medical School and co-workers traced 227 such persons going back several generations, or about 140 years

The condition apparently started with a single couple whose offspring were equally divided between normal-appearing and black children The dark-hued subjects invariably married a normal appearing spouse, and half of their resultant offspring were black and half were normal in color When two normal-appearing descendants married, they produced no black children The investigators ascertained that these people had black hemoglobin but were normal in every other respect No explanation for this occurrence has been found, and it is not known which constituent of hemoglobin is responsible for the dark coloration

UNITED KINGDOM

Anglo-American Medical Society—The Anglo-American Medical Society has recently been founded in Cambridge and expects to meet every two months Its aims are "to promote a close social and professional liaison between the American doctors in East Anglia and their British colleagues, and to examine more closely attitudes, values, and customs as they apply to medicine in both countries " Membership in the society is open to medical practitioners of Britain and the United States Members may also be elected from closely allied professions at the discretion of the committee Inquiries should be addressed to the Honorary Secretary, Mr A J Eden, Cedar Cottage, March Road, Wimblington, Cambridge The first business meeting and discussion will be held on Sept 7

Operating Room Ventilation—Investigation of hospital outbreaks of *Staphylococcus aureus* infection have shown that operating rooms may provide a potent source of cross infection This can be mitigated to some extent by giving attention to the clothing worn by staff, excluding contaminated bedding, detecting carriers, and restricting movement in the operating room Even so some of the pathogens remain in the air, and it is the function of the ventilating system to remove these as rapidly and completely as possible

Efficient ventilation depends on exclusion of air from other parts of the hospital and on maintenance of positive pressure to ensure an outward flow of air at all times Ideally, exhaust fans and ports should be dispensed with entirely, but this is not always practicable A simple solution is to provide exhaust ports fitted with weighted flaps, which close when doors are opened, sited in positions to ensure the desired pattern of air flow The best method of supplying air is believed to be by a series of symmetrical inlets in the ceiling In order to displace contaminated air in the operating room, the incoming air must be a few degrees warmer than the room temperature

Various methods of ventilation were tested in dummy operating rooms Some of the important practical points which emerged were that in twin operating rooms the amount of contamination in the second may be as much as a quarter of that in the one in which the organisms were liberated Where autoclaves are installed, careful attention must be given to thermal insulation, otherwise the heat generated will effectively defeat the whole purpose of controlled ventilation Important as these experimental studies are, it remains to be seen whether they hold good for operating rooms under normal working conditions The difficulty of obtaining reliable information in such circumstances is outweighed by the practical advantages which may be expected

Chronic Furunculosis—L G Tulloch and co-workers of Bristol (*Brit M J* [July 30] 1960) divided a series of patients with chronic furunculosis into two groups All that the controls did was to swab the boil-bearing areas twice a day with a 1 3,000 aqueous solution of mercury bichloride The test patients were given an antiseptic cream to apply to the anterior nares two or three times daily for at least three months Except for the first few patients who were treated with a neomycin-gramicidin ointment, the preparation used was a combination of neomycin and bacitracin made up in a water-miscible base instead of the standard greasy base

The same cream was applied to the eyelids when eye swabs revealed pathogens in the absence of inflammation Blepharitis was treated with a cream made up of hydrocortisone and neomycin (Neo-Cortef) Otitis externa was treated with Neo-Cortef drops During the later part of the investigation hexachlorophene baths were prescribed for perineal carriers The baths were taken daily for one week, then every second day for two more weeks, and then twice weekly for six to eight weeks Those who could not carry out the bath routine were given a talcum powder containing 0 3 per cent hexachlorophene to apply daily to the perineum, buttocks, and trunk

The detection and eradication of sources of reinfection is of primary importance in the treatment of recurrent boils and styes and should be accomplished before other methods of treatment are tried A thorough clinical and bacteriological search for carrier sites on the patient's own body should first be undertaken The nose and superficial lesions such as blepharitis and otitis externa are often important sources of staphylococci, and so is the perineum, especially when boils are affecting the trunk, buttocks, and thighs The search for sources of reinfection should extend to other members of the family when necessary

The clinical success of this treatment was remarkable, in view of the fact that complete suppression of nasal carriage was often slowly and sometimes only temporarily achieved Subsequent experience has shown that a more intensive treatment, with nasal disinfectant cream applied five or six times instead of twice a day, usually suppressed the carrier state within a few days, and that persistence with the treatment for an additional two weeks often cured it permanently, provided other sites were treated simultaneously Nevertheless, it may be wise to minimize the risk of recolonization by continuing the treatment for longer than this minimum period A study of the treatment of nasal carriage among in-patients suggested that a nasal cream containing neomycin and chlorhexidine may be the agent of choice Sensitization to neomycin has been reported, but it did not occur in the present investigation

Since staphylococci may be carried on areas of normal skin other than the perineum, and therefore might not be detected by swabbing, hexachlorophene baths or powder were prescribed for all patients Successful treatment of the staphylococcal carriers depended largely on the patient understanding the purpose of the treatment and his diligence in carrying it out He should be given a clear and simple explanation of the nature of staphylococcal carriage and infection Time spent thus is never wasted The uninformed patient is almost certain to weary of the treatment and to give it up too soon

Armed Forces Medical Service—The Defense and Service Ministers refused to adopt unification as a long-term objective for the Armed Forces medical services The reasons for rejecting the proposal include the beliefs that (1) unification would adversely affect recruiting, (2) there would be no saving but costs might even rise, (3) it would be wrong to take the risk of changing to a system which might prove less effective, (4) a great deal has already been achieved in pooling efforts and eliminating differences in practice between the medical branches of the three services, and (5) the scope for improving efficiency or saving money is less in interservice co-ordination than in detailed improvements and economies in the individual medical services

CORRESPONDENCE

GENERAL WOOD

To the Editor:—On Oct. 9, the United States, and especially the American medical world, proudly celebrated the 100th birthday of Leonard Wood, who, in the military as well as in the political history of the country, is one of the most colorful and successful personalities. He was Chief of Staff of the Army from 1910 to 1914. He began his career as a physician with an M.D. from Harvard University. In the campaign against the Indian chief, Geronimo, as first lieutenant and assistant surgeon, he was decorated for bravery with the Medal of Honor. Twelve years later at the outbreak of the Spanish-American War he organized a regiment of rough riders and was its commanding colonel; Theodore Roosevelt was his lieutenant colonel. After the war, Wood first became military governor of Santiago and later governor general of the whole of occupied Cuba. With skillful and professional supervision, Wood improved the sanitation conditions of Cuba and took care of the building of public works. Under his supervision, Major Walter Reed did his famous research on yellow fever. In February, 1901, Wood became brigadier general. As military governor he went in 1903 to Mindanao, the great southern island of the Philippines, and in 1908 returned to the United States and started his work for military preparedness, which led to his appointment as chief of staff. In 1914 he retired from military service to enter political life; in 1920 he became a candidate for Republican presidential nomination, and in 1921 the University of Pennsylvania made him her president, but in the following year, with a leave of absence, he went again to the Philippines as the governor general. About 12 years after Governor Wood's tour of duty, I immigrated to the Philippines and, as a lecturer of medical history at the Philippine university, came in friendly contact with many of the leading men in the Philippine government. I heard much about Leonard Wood from his former political opponents and friends. There was no one who spoke about him without respect. He died on Aug. 7, 1927, in Boston.

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CARDIOVASCULAR DISEASE AND HARDNESS OF WATER

To the Editor:—The paper by Schroeder on mortality from cardiovascular disease in relation to treated water supplies (*J. A. M. A.* 172:1902 [April 23] 1960) does not state the magnitude of the difference in mortality rates for white men (aged 45 to 64 years) living in hard water and soft water states. The 12 states with softest water (lowest quartile) show a death rate for cardiovascular diseases that is only 10% higher than the 12 states with hardest water (when each state's population is given due weight). Furthermore, the 12 softest water states show an average death rate for these diseases (if each state is given equal weight) barely above the national average. Six of these 12 states are below the national average in mortality rate for these diseases. Such facts do not lend support to the hypothesis that soft or softened water increases cardiovascular mortality; indeed, the coronary death rate of the 12 states is below the national average.

Dr. Schroeder apparently assumes that other factors are equal or nearly so. But they are not. Most of the hardest water states are sparsely settled and less urbanized, while most of the softest water states are more densely settled and more urbanized. Data from the U. S. Bureau of the Census for 1950 are published in the "World Almanac," showing the density of population (persons per square mile of dry land) for each state (page 267 of 1960 edition or page 264 of 1956 edition). If each state is given equal weight, the 12 most densely populated states (highest quartile) show a death rate from cardiovascular diseases that is 25% higher than do the 12 least densely populated states (lowest quartile); the coronary death rate is about 30% higher. The 12 most densely populated states (each given equal weight) show a death rate for these diseases that is above the national average, while the 12 least densely populated states show a rate below the national average. (The 12 most densely populated states are Connecticut, Delaware, Illinois, Indiana, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania, and Rhode Island. District of Columbia is the most dense area but is not a state. The 12 least densely populated states are Arizona, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Wyoming.)

Only one of the 17 states with cardiovascular death rates above the national average (Nevada, with less than 1% of the population of these 17 states) has a population density below the national mean. But four of these 17 states (California, Florida, Illinois, and Nevada), constituting about 30% of the population of the 17 states, have drinking water harder than the national average.

Hardness of water may, however, prove to be a minor factor in cardiovascular mortality. I agree with your editorial admonition 'Go West But Not Too Far West', regardless of the hypothesis on which it is based.

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The above comments were referred to the author of the contribution cited and he has submitted the following reply.—ED.

To the Editor:—Doctor Menaker has pointed out a defect inherent in the correlation coefficient, which relates two progressively changing variables, but does not indicate magnitude of change. Conceivably a high coefficient can be calculated when changes are very small but progressive. Analysis of death rates from coronary heart disease by state shows similar results, the mean death rate in the highest quartile being 525.3 (which is lower than the national average) and that in the lowest 436.1 per 100,000 population, an increase of 20 per cent. Giving equal weight to each state, large or small, however, and comparing means of quartiles with the national average neglects the factor of the size of the population affected. One must use other methods with the data in the smallest valid units such as states or cities. The correlation coefficients and distribution by the chi-square method suggest that the differences found are not due to chance, if statistics have any validity, and that there is a demonstrable relationship between two variables, and nothing else.

Second, I do not "assume that other factors are equal or nearly so." They obviously are not. Climate, rainfall, geochemical structure and composition of soil obviously differ. Many human and industrial factors may also differ. One must be cautious in drawing conclusions from any epidemiological study and tread carefully through its statistical mazes.

Third, Doctor Menaker chooses density of population as a possible factor in explaining variations in death rate from cardiovascular (but not other) diseases. I have not considered this factor in detail because the correlation coefficients with density of population per square mile by state were small: with total cardiovascular death rates, age adjusted, white males aged 45 to 64, $r = +0.279$ (p 0.05), with weighted average hardness of water, $r = -0.292$ ($p<0.05$). These values are low compared with those for cardiovascular death rates and hardness of water, where $r = -0.53$ ($p<0.001$), changing to -0.489 when density was 'partialed out.' Therefore density of population appears to influence these death rates negligibly. In Japan, where geographical variations in cardiovascular death rates are great, the highest rates are in the less populated northeastern prefectures, the lowest are in the densely populated middle and western prefectures of the main island, following geological rather than demographic factors.

Furthermore, while all raw data could not be given in my report, to avoid the influence of density of population, analyses of death rates for coronary heart disease in white males, aged 45 to 64, and a number of factors in municipal water supplies for 163 of the largest municipalities of the United States showed fair to good correlations, as reported. The magnitude of variation in cities is large. The mean death rate for the 10 highest municipalities was 754.1 per 100 000 population, with mean total hardness of 54.6 ppm., while that for the ten lowest was 369.9 per 100,000 population, with mean hardness of 203.9 ppm. or 49.1 and 373.4 per cent of former values respectively. Rates from other cardiovascular diseases were not available. These 20 cities had in 1950 populations from 52,000 to 570,000, the 10 with highest rates having 1,991,000 and the ten with lowest 686,000 persons.

There may be a trend towards higher death rates from coronary heart disease in our larger cities, but it is by no means clear-cut. Of the 20 largest cities 9 ranked in the first quartile in order of death rate, out of 163 municipalities, 6 in the second, 4 in the third and 1 in the fourth. Mean water hardness was 79.2 ppm. and magnesium content 5.9 ppm. for the first 10, for the second 98.6 and 7.5 ppm. respectively. These differences are not large, and as in all biological correlations, there are many isolated exceptions. On the other hand, of the 29 cities with death rates statistically higher than average at the 0.05 level of confidence, finished water hardness averaged 66.4 ppm. as compared to the 23 cities with rates significantly below average, where hardness averaged 177.4 ppm. Magnesium values were 4.1 and 16.0 ppm. and pH 7.53 and 7.89 respectively.

Although not disproving Doctor Menaker's thesis, which implies that stress and strain of crowded areas may influence death rates, further detailed studies of this phenomenon have served to pin-point which diseases appear to be affected by *some* geographical factor related to hardness of water and which are not (*J. Chron. Dis.*, in press). Negative correlation coefficients large enough to be generally accepted as significant ($p<0.02$ to <0.001) were found only for those cardiovascular diseases believed to be dependent upon hypertension and atherosclerosis (International List, Categories 420, 330-334, 440, 443-444, 447, 450) but not for others (421-422, 410-416, 430-434, 592-594). A negative correlation for male respiratory tract neoplasia and a positive one for congenital malformations were also found. Coefficients were small or negligible for all others of the 10 leading causes of death and subdivisions thereof (white persons, aged 55-64) when death rates exceeded 10 per 100,000. Therefore, it appears that only certain diseases are geographically influenced, and that some quality of water follows the same pattern

I do not imply that something in water is causal The lowest cardiovascular death rates in the United States are still sizeable compared with those in some other countries Furthermore, most correlation coefficients, while significant, are fairly small There does, however, appear to be an influence on the death rate, this influence being linked somehow to water, or to some factor to which water is related As a first approach to solution of the problem, although an etiological factor might well not be found, a study of water might be rewarding, for water is one localized "dietary" variable to which all persons are exposed Also water lends itself to exact measurements, while stress and strain do not

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IF THE CAT SCRATCHES

To the Editor —I was interested in the editorial, "If the Cat Scratches," in The Journal, Aug 13, page 1665 There is, however, one error, historically, in this editorial It is stated that Foshay first prepared a skin-test antigen for the diagnosis of the disease This is incorrect When Dr Frank MacMurray and I first became interested in this disease we had extensive correspondence with Dr Foshay and with Dr Franklin H Hanger, Presbyterian Hospital, New York In our paper, read before the Association of American Physicians, May 1, 1951, we covered the information concerning development of the antigen This paper was published in the *Archives of Internal Medicine*, December, 1951, page 736 In that paper we stated that Dr Hanger had a skin lesion on the finger which developed after gardening There was a cat in the household, but Dr Hanger had no history of scratch He developed suppurative regional adenitis associated with fever and constitutional symptoms An antigen was prepared from the aspirated pus by Dr Hanger and Dr Harry M Rose This gave an intense, tuberculin-like intradermal reaction in Dr Hanger himself and also in patients previously studied by Foshay The material produced no skin reaction in controls I thought that The Journal would wish to give credit to Hanger and Rose for the development of the skin-test antigen

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NAMING THE BENTONITE PROCEDURES

To the Editor —It has become evident (Bloch and Bunim J A M A 169 307 [Jan 24] 1959, Lane and Decker J A M A 173 982 [July 2] 1960) that the term "bentonite flocculation test" (BFT) is being used exclusively to denote the test for rheumatoid arthritis reported by Bozicevich, Bunim, Freund, and Ward in 1958 (*Proc Soc Exper Biol & Med* 97 180 [Jan] 1958) This designation is erroneous in that the bentonite in this test serves merely as a carrier system for the F II fraction of serum and this same carrier system has been used with other substances in performing flocculation tests Bentonite flocculation was first used in testing for antibodies to trichina in 1951 (Bozicevich and others *Pub Health Rep* 66 806 [June 22] 1951) and, more recently, with desoxyribonucleic acid (DNA) in testing for antinuclear factors in the serum of patients with systemic lupus erythematosus (Kayhoe, Nasou, and Bozicevich *New England J Med* 263 5 [July 7] 1960, Bozicevich, Nasou, and Kayhoe *Proc Soc Exper Biol & Med* 103 636 [March] 1960)

The potential applications of this bentonite system are considerable To prevent confusion in the future, we suggest that "bentonite flocculation test' be retained as a generic term and the sensitizing substance be prefixed to this For example, the test for rheumatoid arthritis would become the F II bentonite flocculation test (F II BFT), for trichinosis, trichina-BFT, and for systemic lupus erythematosus, DNA-BFT An alternative, but more cumbersome system of nomenclature would be to specify the purpose of the procedure, e g, the BFT for rheumatoid arthritis, BFT for trichinosis, and the BFT for systemic lupus erythematosus Regardless of which system is adopted, the true meaning of the bentonite procedures will be preserved and confusion in future publications will be avoided

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RUPTURED PEPTIC ULCER DURING TRIAMCINOLONE THERAPY

To the Editor —In the paper by A W Danish and M P Landman, "Ruptured Peptic Ulcer During Triamcinolone Therapy," in The Journal, June 25, page 900, a statement was made that this was believed to be the first reported case of such an occurrence In a paper by J G Smith Jr, M F Engel, and H Blank, entitled "Triamcinolone in Dermatologic Therapy" (*J Florida M A* 96 960 [Feb] 1960), the rupture of a silent peptic ulcer occurring after one week of triamcinolone therapy in a dosage of 16 mg per day is reported

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MEDICAL FILM REVIEWS

Forty Causes of Acute Abdominal Pain 16 mm color, sound, showing time 33 minutes Prepared by Hilger Perry Jenkins, M D, Chicago Procurable on loan from American Cyanamid Company, 1 Casper St, Danbury, Conn

This film is a cinematic survey" of the various causes of acute abdominal pain which frequently are encountered There is a correlation of the preoperative history, clinical findings, and roentgenographic findings with the operative findings of the various disease processes which may be responsible for causing acute abdominal pain These include acute hemorrhagic pancreatitis, acute cholecystitis, perforated duodenal ulcer, hemorrhage into a leiomyosarcoma of the stomach, acute Meckel's diverticulitis, acute appendicitis, and bowel obstruction There is particular emphasis on the preoperative roentgenographic findings in each instance, with enumeration of the essential diagnostic features of each It is a compilation of many filmed case reports, and as such the quality of photography is not consistent but is generally quite good The narration seems somewhat hurried but is no doubt concise enough for the content This film is highly recommended, not only because of its excellent technical presentation but also because a review of these various disease processes will stimulate the surgeon and the physician to consider these various etiological factors when he encounters the patient with acute abdominal pain

If I Had an Ulcer 16 mm, color, sound, showing time 27 minutes Prepared in 1959 by Philip Thorek, M D, Chicago, under a grant in aid from Warner Chilcott Laboratories Morris Plains, N J Procurable on loan from Ideal Pictures Corporation 233 W 42nd St, New York 36

This is a photographic record of a lecture on the subject of peptic ulcer It is presented in the dynamic fashion that characterizes the platform appearances of the author before medical audiences While the film is somewhat static, there is a great amount of interest engendered by the lecturer as a result of his excellent use of visual teaching aids Dr Thorek discusses his subject by telling how he handles this entity in his own practice Peptic ulcers are divided into two categories, gastric and duodenal The gastric ulcer is potentially malignant and is best treated surgically The duodenal ulcer is nonhormonal, seldom becomes malignant, and responds in most instances to medical treatment If the patient does not respond to medical treatment within four weeks after diagnosis of a gastric ulcer, then a resection with an anastomosis is recommended With the duodenal ulcer, he states, one may employ antacids, psychotherapy, and a proper dieting regime" In this regard he employs the teaching aid of the letter S The patient should have no foods with seeds, strings, or skins, nor should there be permitted any spices, stimulants, or smokes

Certain complications of the ulcer are discussed These include the refractory patient, the refractory ulcer, the penetrating ulcer, the perforating and the perforated ulcer, obstruction, and hemorrhage In discussing hemorrhage, the lecturer advises to transfuse every bleeding ulcer with small transfusions of 125 to 250 cc, given slowly and at frequent intervals The surgical treatment of the perforated ulcer as well as the bleeding ulcer is discussed and demonstrated The fact that this motion picture is in color and makes good use of illustrative visual aids contributes to the interest generated by dynamic presentation The narration is clear, concise, and will be perfectly understood by almost any viewer This film is most instructive and enjoyable It is highly recommended as a teaching film for medical students and for showing to physicians attending medical meetings

NEW FILMS ADDED TO A M A MOTION PICTURE LIBRARY

Journey in Health 16 mm, color, sound, showing time 21 minutes Produced in 1960 for the Smart Family Foundation in cooperation with the American Medical Association and the American Academy of Pediatrics Procurable on loan (no service charge) from American Medical Association, Motion Picture Library, 535 N Dearborn St, Chicago 10

This film stresses the importance of preventive medicine among children through regular and continual health supervision by a physician In a series of flashbacks, Dr Fowler, a pediatrician, recalls some of the cases in his career when continuous health supervision prevented a child from suffering throughout life from a congenital difficulty Viewers are also impressed with the need for early and regular visits to the physician by seeing children who came to Dr Fowler too late for him to detect and correct various problems

The film shows that a health examination must be extremely thorough and include a complete study of the child's growth and development—both physical and emotional Also outlined is the frequency with which children of different ages should visit a physician This film does an excellent job of presenting the concept of continuous health supervision by a physician The advisability of booster shots for maintaining immunity is well illustrated by the example of using a booster shot in conjunction with an injury as a preventive of tetanus Unfortunately, an equally important procedure, tuberculin testing, was overlooked in the development of this film but could well be included in the continuous health supervision practices

The manner in which the physician in the picture handles his child patients is excellent The voice is good, the color is excellent, and the characters are personable It is recommended for parents and for professional groups, particularly physicians, nurses, and others who are concerned with health services and continuous health supervision

Medifilm Report II 16 mm, black and white, sound, showing time 33 minutes Produced in 1960 by Fordel Films Inc, New York for the Schering Corporation and the American Medical Association Procurable on loan (no service charge) from American Medical Association, Motion Picture Library, 535 North Dearborn St, Chicago 10

Produced for physicians who were unable to attend the 109th Annual Meeting in Miami Beach, this film features scientific exhibits, lectures, and panel discussions Host-narrator is Dr Ralph Jones, Jr., of the Dade County (Florida) Medical Society and Professor of Medicine at the University of Miami

Exhibits covered include those of Dr E Sterling Nichol of the Miami Heart Institute, who discusses long-term use of anticoagulants for the prevention and treatment of recurrent myocardial infarction, Dr Donald Berkowitz of Philadelphia, who explains the difficult problems of diagnosis and management of the patient with chronic functional diarrhea, the Illinois State Medical Society, which presents a history of medicine in an unusual collection of postage stamps, Dr Robert A Kuhn of Morristown, N J, who describes the diagnostic technique of retrograde brachial angiography in patients with stroke, and Dr Gordon McHardy of New Orleans, who presents "current concepts of duodenal ulcer"

Panel discussions are presented through interviews with Dr Robert E Olson, who reports on the nutrition symposium, and Dr J Walter Wilson of Los Angeles, who moderated a panel which discussed the use of griseofulvin in the treatment of certain fungous infections of the scalp, nails, groin and feet

Viewers will also meet Dr Philip Thorek of Chicago as he lectures on the importance of differentiating between duodenal and gastric ulcers, since "every gastric ulcer is a potential carcinoma until proven otherwise"

Winners of two Gold Medal Awards, presented by the AMA Council on Scientific Assembly, give brief descriptions of their exhibits

In closing, Medifilm Report II introduces Dr E Vincent Askey of Los Angeles, newly elected president of the AMA, who remarks in part "For those of you who were here in person with me, I'm sure you'll agree that we have added greatly to our knowledge and ideas"

The Disability Decision 16 mm, black and white, sound, showing time 28 minutes Produced in 1960 by Reid H Ray Film Industries, St Paul, for the Department of Health, Education and Welfare, Social Security Administration, Bureau of Old Age and Survivors Insurance with the cooperation of the American Medical Association Procurable on loan (no service charge) from American Medical Association, Motion Picture Library, 535 North Dearborn Street, Chicago 10, or state agencies which evaluate social security disability claims or local social security district offices

This film was produced to help inform the physician of his role in the determination of disability under the government's Disability Benefits Program It shows, through the narration of an actor playing the role of a physician talking before a medical society and through "flashbacks," what happened to three patients who were applying for disability benefits It emphasizes that disability as defined under this program is the inability to engage in any gainful occupation It emphasizes that the physician's role is to determine the physical impairment of the patient and that his reports to the governmental agency must contain complete information on the diagnosis, the patient's functional ability, supporting laboratory and physical findings, and an evaluation of the impairment to enable the reviewers of the governmental agency to make an accurate evaluation of the individual's physical status The film is well done, and the narration by the actor who portrays the physician is excellent This instructive film is recommended for medical society and hospital staff meetings

Dynamics of the Developing Chick Otocyst 16 mm, color, sound, showing time 14 minutes Prepared in 1960 by John P Reinecke, Tawfik F Girgis, M D, George W Allen, M D, and George E Shambaugh, Jr, M D, Chicago Procurable on loan (service charge $2) from American Medical Association, Motion Picture Library, 535 North Dearborn Street, Chicago 10, Ill

This film demonstrates the technique of preparing the chick otocyst for time-lapse cinematography, and it illustrates parts of the development of several structures such as a crista and sensory epithelium Several examples of similar structures fixed and stained by various techniques are included The photography is excellent, and the techniques, along with illustrations of the growing structures including cell mitosis, are clearly shown The film is useful as a demonstration of the method by which time-lapse photography may be used in connection with tissue culture techniques It is recommended for graduate and undergraduate students in biological sciences

BOOK REVIEWS

Medical Research and the Death Penalty A Dialogue By Jack Kevorkian, M D Cloth $2 50 Pp 75 *Vantage Press, Inc, 120 W 31st St, New York 1 1960*

The author argues that a condemned prisoner should be able to choose anesthesia from which he would never awaken (for the purpose of medical experimentation to be subsequently performed) as a method of execution Whereas he does not discuss the merits of capital punishment he asserts that since it is used, the use of anesthesia would result in a more pleasant death for the condemned This would also be of great benefit in medical research and, in turn, of great benefit to society The material is presented in the form of a debate The author assumes the role of the protagonist, while the antagonist is representative of newspaper articles, personal letters, and private communications

The author believes that some of the merits of using anesthesia as a form of execution are as follows It is a relatively more pleasant way to die than by the electric chair, gas chamber, or hanging The condemned would then be in a state of clinical death, a term meaning that part of non-existence which is characterized by the possibility of being resuscitated" He could remain in this state for hours, days, or weeks, depending on the experiment Much knowledge could be gained by such experimentation on live persons The execution of a human being would not be entirely without gain, the condemned would be, perhaps, paying his debt to society, and society, in the long run, could benefit from the research that would be possible The condemned man cannot satisfactorily pay society by involuntarily losing his life, death by anesthesia, making research possible, gives him a chance for restitution The choice would always be the prisoner's, and a survey has shown that many are for the idea

The antagonist, on the other hand, believes that the use of anesthesia as a form of execution would be harmful as it might encourage more recommendations of capital punishment The most conscientious physician will oppose the plan as ethically he is bound to the proposition that human life should never be taken, the physician would become in part an executioner It will be harder to abolish capital punishment if the benefits derived from it seem so worthwhile, as they might be from great medical experimentation The condemned man might acquire an aura of saintliness This would defeat the purpose of capital punishment and extoll the transgressors

One point that is not covered in this book is just how valuable medical research would be on a person who could not be resuscitated and whose recovery and conditions could not be checked Could such experiments as those performed on the brain, for instance, (a field which the author mentions) be judged accurately? How worthwhile would such experiments be? More could have been mentioned on specific gains from such research

The discussion is presented in a concise manner and the antagonist raises many questions that might be anticipated by the reader Readership appeal should extend to others as well as to persons in the field of medicine as the problem is one for society as a whole The book provides incentive for further research on the possibility of the use of anesthesia as a means of execution

MARY ANN ROSENFELD

The Golden Age of Quackery By Stewart H Holbrook Price, $4 95 Pp 302, with no illustrations The Macmillan Company, 60 Fifth Avenue, New York 11, 1959

On more than one occasion I have commented upon the fact that the capacity of the human mind to deceive itself knows hardly any limit Perhaps this is only just less cynical than Mencken's hard but shrewd statement that "Nobody ever lost money by underestimating the intelligence of the American public " Human nature being what it is, the history of mankind reveals that people who want to help their fellow man deceive himself have always been in ample supply Some even sense a surfeit 'The Golden Age of Quackery' deals with a phenomenon of self-delusion in the United States which, though not by any means extinguished, passed its high point during the first decade of the present century Morris Fishbein and many others have waged an effective campaign to expose frauds, quacks, nostrums, and fakes of various kinds Though diploma mills still operate, "doctors" fraudulently practicing medicine are very few and far between despite the wide publicity splash one of them may make from time to time Holbrook has taken a topic which should be fascinating for all physicians, combining exuberance with whimsy to produce a most delightful book Here we read all about the vastly overrated medicinal qualities of sarsaparilla, the virtues of celery, the incredible success of Lydia Pinkham and others who managed to make alcohol acceptable in a medicine where it would not be accepted in a sherry glass There is much detail about nostrums for lost manhood, institutes for men only," and some of the curious byproducts of the fact that the word syphilis was for so long a shibboleth Read all about Peruna, Swamp Root, The Invalid s Friend and Hope, and how they were popularized by the eager shill men of yesteryear They are paraded here with delight The machines, Perkins' metallic tractors, the wires, the gadgets, the flicking lights, the medical shows, and the vast testimonial racket wink, leer, and vibrate for us The conspiracy of the clergy in providing all those testimonials is a recurring example of ignorance defrauding innocence

One of the most fantastic of the crop of merchants of fraud, preying on the eager victims ever in search of magic, was Dr Abrams, who began as an orthodox physician but soon found the greener pastures of quackery His rise and the American Medical Association's dogged and finally sucessful pursuit of him is one of the choice morsels of this exotic collection

The remarkable role of Samuel Hopkins Adams in exposing some of the hopes and hoaxes is emphasized by the author Physicians owe a great debt of gratitude to Holbrook for this enchanting example of the wiles and stratagems with which the ignorant are defrauded The definition of man as the medicine-eating animal gets strong validation in this volume

William B Bean, M D

Excerpted from Arch Intern Med **106** 580 (Oct) 1960

Annual Review of Physiology Volume 22 Victor E Hall, editor Frederick A Fuhrman, associate editor Arthur C Giese, associate editor Published by Annual Reviews, Inc , and American Physiological Society Cloth $7 (U S A), $7 50 (elsewhere) Pp 725, with illustrations Annual Reviews, Inc , Palo Alto, Calif , Maruzen Company, Ltd , 6, Tori-Nichome, Nihonbashi, Tokyo, Japan, 1960

This year's volume of the *Annual Review of Physiology* contains some chapters which continue subjects from last year's volume, namely reproduction, kidneys, water, and electrolytes, respiration, heart, peripheral circulation, alimentary tract, nerve excitation and synaptic transmission, visceral, somatic, and higher functions of the nervous system, and the adenohypophysis and adrenal cortex Topics not represented in last year's volume are nuclear function and nuclear-cytoplasmic interactions, physiological aspects of genetics, developmental physiology, fuel of muscle metabolism, blood pigments, blood volume regulation, and physiology of vision Last year's chapter on the pancreas, insulin, and glucagon is followed this year by a chapter on the thyroid

The amount of research work reviewed in these annual volumes is staggering, and the authors of the reviews deserve recognition for undertaking the labor of organizing the mass of new information and making it accessible to their colleagues Fortunately the modern machinery for handling bibliographic data has facilitated much of the work, especially the preparation of author and subject indexes which are essential features of books of this kind The text makes strenuous reading This is especially true of the chapter on respiration, where it has been necessary to make frequent use of a complicated mathematical notation including Newton's method of denoting a time-rate of change by placing a dot above the symbol for the affected variable Difficulties of this sort are inevitable in dealing with such technical subject matter The prefatory chapters that have been included annually since 1950 help much to leaven the product, and this year's interesting contribution by F C McLean, which traces the multitudinous influences that determine the course of a scientist's thinking, is one of the best

Frederic T Jung, M D

Oral Anatomy By Harry Sicher, M D , D Sc , Professor of Anatomy and Histology, Loyola University School of Dentistry, Chicago Third edition Cloth $13 50 Pp 514, with 314 illustrations C V Mosby Company, 3207 Washington Blvd , St Louis 3, Henry Kimpton, 134 Great Portland St , London, W 1, England, 1960

In his introductory remarks the author strikes at the core of the major problem in dental and medical education—the correlation of basic scientific knowledge and clinical practice In this third edition the ultimate success has been achieved, as far as can be in the written word, in making this correlation realistic The author says, "This book tries to bridge the gap between theory and practice and to prove that anatomic understanding does not only facilitate clinical work but that it also allows for the substitution of a rigid clinical technique by an adaptable and therefore potentially progressive action "

The book is divided into two parts The first is concerned primarily with the descriptive anatomy of the head and neck It also includes a comprehensive discussion of head growth and tooth eruption which is essential to logical analysis and treatment of clinical conditions This section has been expanded to include knowledge that has evolved since the publication of the second edition The descriptive anatomy is based on a German text written in collaboration with the anatomist Dr Julius Tandler Many of the excellent illustrations are taken from this text

The second part is devoted to regional and applied anatomy, and it is in this part that the author's talent in bridging the gap between theory and practice is apparent His understanding is the result of close association with competent clinicians and the discipline of scientific truths directing his thinking Some of the subjects discussed and profusely illustrated in detail are the anatomy of local anesthesia, arterial hemorrhages and ligation of arteries, propagation of dental infections, and techniques of tracheotomy and laryngotomy The chapter on the temporomandibular joints includes the most recent and comprehensive thoughts on functional disturbances, dislocation, and surgical exposure It is a broad but concise clinical application of the descriptive anatomy and growth of the joint structures covered in Part I

The entire text is dynamic in that the consideration of basic anatomy is reinforced by studies of growth and function, normal and abnormal It supplies an anatomic basis for the practice of dentistry and oral surgery There is little that one can question in this book The material is sound, the continuity is satisfactory and the printing and illustrations are of high quality This textbook should find its place in the library of every dentist, of every dental and medical school, and of every physician who has more than a passing interest in the head and neck

JOHN R THOMPSON, D D S

Zinsser Microbiology By David T Smith M D Professor of Microbiology and Associate Professor of Medicine, Duke University School of Medicine, Durham North Carolina and others Twelfth edition Cloth $13 Pp 1026 with 458 illustrations Appleton-Century-Crofts Inc 35 W 32nd St, New York 1 1960

Originally published in 1910 by Hiss and Zinsser, this textbook has undergone many revisions and changes of title, the last in 1957 The present authors state in their preface that in the last 10 years most departments of bacteriology have expanded to include mycology and parasitology The text has, therefore, been renamed *Microbiology* In this edition, the chapter on general morphology and reproduction of bacteria has been rewritten Other additions include a discussion of Asian influenza and the hemadsorption viruses The public health aspect of each subject has been emphasized New illustrations, some of them in color, have been provided

The various sections deal with the general biology of bacteria and general methods of bacteriology, physiology of micro-organisms, ecology, immunology, pathogenic bacteria, spirochetes, the pleuropneumonia group of organisms, rickettsiae, viruses, mycology, parasitology, and technical methods There is an appendix on the antigenic structure of salmonellae At the end of each chapter there is a bibliographic list There is an index This book remains a definitive and outstanding reference in its field

W G BRANDSTADT, M D

The Multilingual Manual for Medical Interpreting By Louis R M del Guerico M D [and editors for French Italian Spanish German Polish and Russian] Paper $4 Pp 160 Pacific Printing Company Inc, 441 Pearl St New York 38 1960

A how-to-do-it for saying 'stick out your tongue' in six foreign languages, this little handbook is cleverly designed as a compact, inexpensive, and expedient tool to aid the physician in overcoming the language barrier in questioning and examining non English-speaking patients The languages represented are French, Spanish, German Italian, Polish, and Russian, each complete with its own set of questions in English and their foreign equivalents so phrased as to require only 'yes" or 'no' answers A handy index gives access to the particular question the physician may wish to ask The phonetic transliteration of each foreign question is indicated in equivalent English syllables so that the physician may approximate the sounds of the foreign language, without having to learn a set of phonetic symbols, well enough for the patient to understand what is being asked If the patient can read, the physician need only point to the question he wishes to ask While this little booklet will by no means make the physician an expert in these languages, if he follows the phonetic directions and gives a careful ear to the inflections of the patients, his pronunciation and his ability to make his questions understood should be at least as great as though he had taken the regulation introductory one-year courses in these languages

HELEN MARSHALL

The Chemistry of Lipids in Health and Disease A Review of Our Present Knowledge of Lipids, Their Chemical Structure, Their Breakdown and Synthesis in Living Organisms, Their Place in Human Nutrition, and Their Abnormalities of Metabolism in Disease By H K King, M A, Ph D, F R I C, Senior Lecturer in Biochemistry, University of Liverpool, Liverpool Publication number 381 American Lecture Series, monograph in American Lectures in Living Chemistry Edited by I Newton Kugelmass, M D, Ph D Sc D Cloth $3 75 Pp 104, with illustrations Charles C Thomas, Publisher, 301-327 E Lawrence Ave, Springfield, Ill Blackwell Scientific Publications, Ltd, 24-25 Broad St, Oxford, England, Ryerson Press, 299 Queen St, W, Toronto 2B, Canada, 1960

Lipids were one of the more neglected aspects of biochemical knowledge until recent times There were many gaps in the understanding of lipid metabolism and its relationship to disease Most textbooks and many biochemists, even today, present a sketchy and often erroneous picture of lipids

This monograph does an outstanding job of reporting up-to-date information on lipid chemistry and metabolism and their connection with medicine As the author has pointed out about his well-written and excellently diagramed book, the aim is not to influence the reader s judgment, but to give him a background against which he can read and judge current literature, and himself pass judgment on present and future concepts " I found no errors or any contradictory sections according to currently accepted biochemical beliefs

Although steroid hormones are treated in a separate volume of the "American Lecture Series," both the practicing physician and the student should find their time well spent in reading this monograph The eight chapters deal with lipids and water, chemical structure, digestion and absorption of fats, absorption and metabolism of steroids, oxidative breakdown of fats, biosynthesis of fatty acids, glycerides and phosphatides and steroids, lipids and diet in their connection with fats and fuel, the essential fatty acids and fat-soluble vitamins, and lipids and atherosclerosis A well-selected list of references appears at the end of each chapter

LAWRENCE C PARISH

QUESTIONS AND ANSWERS

EMOTIONAL JAUNDICE

TO THE EDITOR —*Recently, in a discussion about various hepatic diseases some colleagues of mine categorically stated that "no pathological condition of the liver has ever been clinically registered as a result of emotional stress" In 40 years of practice, I have occasionally observed jaundice that I believed was due to spasm of the bile ducts caused, essentially, by an emotional upset On such occasions, my diagnosis and findings have been endorsed in consultation with various prominent physicians Is this condition recognized?*
Emilio Michelotti, M D, Brooklyn, N Y

ANSWER —Ivy (*Amer J Roentgenol* 57 1, 1947) reviewed the evidence, showing that the choledochoduodenal mechanism can contract in man with sufficient force to prevent the evacuation of the contracting gallbladder and to counteract the secretory pressure of bile An increase in intracholedochal pressure has been demonstrated in association with emotional stress in human beings (Doubilet and Mulholland, *Surg Gynec Obstet* 86 295, 1948), and it has been shown further that such a rise may be engendered by a hypertonus of the sphincter or of the duodenum (Bachrach and associates, *Gastroenterology* 22 604, 1952) The evidence for an effect of emotions on the flow of bile from the human liver is less impressive (Wittkower, *Klin Wschr* 7 2193, 1928), although cessation of bile flow on a functional basis has been observed repeatedly in animals

Thus, a physiological basis for "ikterus ex emotione" is adequately established, the evidence that it occurs clinically is highly presumptive but not conclusive Greene and associates (*Amer J Dig Dis* 3 622, 1936) described a syndrome of distension of the gallbladder seondary to spasm of the sphincter of Oddi mediated by vagal impulses of central origin, with symptoms of biliary colic and even jaundice, and responding to a regimen of change of environment, mental rest, and sedatives Pavel (*Presse Med* 64 1600, 1956) is convinced that patients with prolonged icterus, intense pruritis, negative parenchymal tests, visualization of nothing but bile thrombi on liver biopsy, normal structures at laparotomy, and prompt establishment of bile flow with relief of itching on drainage of the ducts must present a functional jaundice This is certainly a plausible assumption, but there are not enough cases on record in which all these criteria have been answered and the emotional factors evaluated

The syndrome of "intermittent juvenile icterus," consisting of recurrent hyperbilirubinemia without hemolysis and without disturbances in the functions or the histological structures of the liver, has not yet been explained Schwendy (*Z Ges Inn Med* 12 653, 1957) believes it to be the result of emotional influences, while Muller (*Deutsche Med Wschr* 79 685, 1954) regards it as a chronic hepatitis, although he states that the icterus varies with psychic as well as with physical stresses

It is erroneous to assume that the demonstration of calculi in the common duct in a patient with jaundice eliminates the possibility of an emotional cause We know that emotions can trigger "spasm" of the duodenum and of the sphincter of Oddi, either of which can cause stasis in the biliary tract, which, in turn, predisposes to calculus formation The most recent reviews of the subject are, by Hafner and Freyberger (*Z Psychother Med Psychol* 5 107, 1955) and by Schoeneich (*Klin Med* 47 864, 1952)

WILLIAM BACHRACH, M D

ZINC METABOLISM

TO THE EDITOR —*Is zinc metabolism affected by alcoholism? Is the zinc content of the liver lower in alcoholics? Is the urinary excretion of zinc higher or lower in alcoholics? Are zinc and copper interchangeable in the human body?*
Heino Trees, M D, Washington, D C

ANSWER —Zinc metabolism is affected by alcoholism at least when associated with Laennec's cirrhosis Vallee and co-workers (New Engl J Med 254 1055 [Nov 29] 1957) called attention to the large quantity of zinc excreted in the urine of such patients, and Butt and co-workers, cited in "Metal Binding in Medicine," (edited by M J Seven and L A Johnson, Philadelphia, J B Lippincott Company, 1960) demonstrated the finding of low zinc levels in other organs in a like series of 78 patients He also found values of 12 5 mg of zinc per 100 Gm of dry tissue in livers containing less iron than normal and 17 9 mg per 100 Gm in those with normal to excess iron content These quantities compare with that of 27 6 mg in normal livers Comparable values for copper were 7 7 and 6 7 mg (normal, 4 53) There was little alteration in the copper content of other tissues We can thus assume that zinc and copper metabolism are not interchangeable in alcoholism associated with cirrhosis

EDWARD BIGG, M D

MEAT TENDERIZER

To the Editor.—*What is the chemical that butchers use to 'tenderize' meats? If a man ate two or three large steaks, would there be any toxic effect from this chemical?*

M.D., New York.

Answer.—A solution of the enzyme papain is most commonly used commercially for tenderizing meat. Papain is obtained from the papaya plant. The enzyme softens the connective tissue as well as the muscle protein. Cooking inactivates the enzyme, and no harmful effects have been reported from the use of them in such a manner.

Mary Jane Kibler.

SKIN DIVING

To the Editor.—*Two problems have arisen concerning mixtures of gases that one could use in open-circuit underwater breathing apparatuses for scuba diving. First, would a mixture of compressed gases consisting of 80 per cent nitrogen and 20 per cent oxygen be a safe and a comparable substitute for the usual compressed air used in scuba diving? This mixture does not contain any inert gases and is absolutely pure and completely filtered. Second, the above-mentioned mixture contains absolutely no moisture. Could this mixture be breathed safely for 60 to 90 minutes at a time? I have used this mixture a few times without any apparent ill effects, but I wish to know if it is safe to continue its use.*

R. C. Strong, M.D., Manitowoc, Wis.

Answer.—About the use of 80 per cent nitrogen and 20 per cent oxygen in place of air, there is every reason to suppose that this mixture would be indistinguishable from air in practical situations. The amounts of argon and of other inert gases normally present in the atmosphere are of no practical significance in ordinary skin diving. Investigations done 30 or more years ago, in order to tell whether the rare gases in the physiology of respiration might be analogous to the vitamins in the physiology of nutrition, yielded negative results. The mixture of pure gases which you describe would have the advantage of being known to contain none of the noxious substances that have been reported in carelessly compressed air.

About the absence of moisture, water vapor is a nuisance and a danger when gases are to be compressed. It is therefore removed in advance, and compressed gases are in general extremely dry. Nevertheless, neither the literature on diving nor conversation with divers indicates any need for humidifying gases to be used for this purpose.

F. T. Jung, M.D.

ACQUIRED SICKLE-CELL TRAIT

To the Editor.—*I have just encountered what seems to be a peculiar diagnosis. Among various possible causes of illness in an insurance claimant is the item 'sickle cell trait, possibly exogenous.' Inasmuch as sicklemia is a hereditary disease, I cannot understand how it could be exogenous. I will appreciate discussion.*

John H. Schaefer, M.D., Los Angeles, Calif.

Answer.—The continuous presence of sickle-cell hemoglobin in the erythrocytes is genetically determined. Therefore, the only possible way that "exogenous sickle cell trait" could occur would be through transfusion of a non-sicklemic patient with erythrocytes containing sickle-cell hemoglobin. This has undoubtedly happened on a number of occasions, since sickle-cell-trait (heterozygous S) subjects usually have hemoglobin values adequate for their acceptance as blood donors. Because of low hemoglobin levels, on the other hand, it is very unlikely that sickle-cell-anemia (homozygous S) patients would be used as blood donors. Since heterozygous S blood is generally suitable for transfusion purposes, blood banks do not routinely test for the sickling phenomenon. Thus, one might demonstrate sickling in the blood of the recipient of a unit of sickle-cell-trait blood. However, this finding would be transitory, become progressively less intense, and disappear as the donor cells are all finally destroyed. It should be further emphasized that blood from a donor with sickle-cell trait has not been shown to give rise to illness on the basis of the presence of the biochemically different hemoglobin per se. Any hazards attending its use, therefore, would be the same as for the transfusion of non-sickle-cell blood.

Chris J. D. Zarafonetis, M.D.

FLUORESCENT ANTIBODY TEST

To the Editor.—*Can you tell me if the fluorescent antibody test is reliable and available for office use, and where I can obtain supplies? I understand that a four-hour culturing provides sufficient bacteria to run this test.*

Richard R. Sefi, M.D., Bremerton, Wash.

Answer.—The fluorescent antibody technique has the same specificity as the other antigen-antibody reactions, and it has the advantage that micro-organisms may be identified in mixture or in tissues. The microscope accessories are available from the usual supply houses. A number of commercial laboratories conjugate antibody, but they usually require that it be supplied, and on special order. The utility of the technique for routine office use would depend on the volume of work to be done.

William Burrows, Ph.D.

PHENELZINE AND ANTICOAGULANTS

To the Editor.—*Are anticoagulants and psychic energizers compatible? A patient was under satisfactory anticoagulant control when phenelzine therapy was begun. After several weeks he developed ecchymoses, and the prothrombin activity was found to be low. The dose of the anticoagulant, acenocoumarin, was halved, and again therapeutic levels were maintained. Subsequently, phenelzine was omitted, and four days later the prothrombin activity was reported as 100%. Do all psychic energizers produce this effect? May the two drugs safely be given together?*

Henry C. Lincoln, M.D., Swansea, Mass.

Answer.—We know of no published reports or theoretical considerations which would justify an assumption that the anticoagulants and psychic energizers are incompatible. No cases similar to yours, in which there seems to be a depression of the prothrombin activity by phenelzine, have come to our attention, nor have reports of a similar action by related drugs been noted.

Some drugs of this group, particularly those known as monoamine oxidase inhibitors, are known to impair liver function in some patients, and severe hepatic damage may be associated with hypofibrinogenemia and hypoprothrombinemia and abnormal bleeding tendency. This is at least one theoretical explanation of the phenomena which you have observed. It would be interesting to know whether your patient showed any other signs which might indicate liver damage. We know of no general contraindication to the concomitant use of anticoagulants and psychic energizers.

Christian Wingard, M.D.

DEFICIENCY OF FACTOR X

To the Editor.—*How do you differentiate a deficiency of factor X from the other coagulation defects?*

Heino Trees, M.D., Washington, D.C.

Answer.—Factor X simulates proconvertin (factor VII) more closely that any other plasma clotting component. For several reasons it is *important* to distinguish between the two. The cardinal abnormalities resulting from deficiency of either is an elevated one-stage prothrombin time (Quick), and retarded two-stage prothrombin activation by thromboplastin and calcium, an assay method used in some laboratories for measuring plasma prothrombin activity.

There are several ways to distinguish between deficiency of factors VII and X: (1) in factor X deficiency there is poor prothrombin consumption, resulting in an abnormally high level of residual prothrombin demonstrable in the serum after blood clotting has been allowed to run its course (one hour after the blood is shed), (2) since factor X is essential for elaboration of "intrinsic" thromboplastin, namely the thromboplastin which generates in shed blood, the thromboplastin generation test (TGT) is markedly abnormal when the patient's serum is tested, whereas under the same conditions the TGT is normal in factor VII deficiency, (3) in the prothrombin time tests in which thromboplastin is added to whole plasma, Russell's viper venom (RVV), used as a substitute for tissue thromboplastin (brain or lung), gives a normal prothrombin time in factor VII-deficient plasma, whereas RVV cannot correct the elevated prothrombin time of factor X-deficient blood, and (4) factor X-deficient blood can correct the elevated prothrombin time of factor VII-deficient blood when admixed with it, but does not correct a known factor X-deficient blood. *Conversely, factor VII-deficient blood can correct the defect in factor X deficiency, whereas it is unable to do so in known factor VII deficiency.*

POST-TRAUMATIC HERPES ZOSTER

To the Editor.—*A patient, while sitting at her desk, turned in a swivel chair to answer a telephone at an adjoining desk. In doing so, she struck her forehead on a piece of angle iron supporting a fuse box. There was no loss of consciousness, no laceration, and no contusion. After the accident the patient complained of headache, vertigo, and nausea. She was hospitalized for observation with no abnormal findings. The patient had had mild hypertension with attacks of headache, vertigo, and nausea for a number of years. Eleven days later she developed herpes zoster involving the left side of her face, scalp, and neck and her left shoulder. What is the likelihood of the herpes being the result of the trauma?*

A. C. van Ravenswaay, M.D., Tucson, Ariz.

Answer.—It is controversial whether trauma can incite the appearance of herpes zoster. In individual cases much difficulty arises in medicolegal interpretation. One of my patients fell heavily on her shoulder. Six days later, herpes zoster appeared on the segment including the injured shoulder. It is difficult to entirely discount the role of trauma in herpes zoster when the events are closely associated.

Theodore Cornbleet, M.D.

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DISPENSING DRUGS

To THE EDITOR —*What is the current stand of the AMA on dispensing of drugs by the physician in his private office? Under what circumstances may a physician ethically dispense drugs other than by injection?*

Charles E Buck, M D , Longview Wash

ANSWER —The Principles of Medical Ethics which were revised in 1957 provide that drugs remedies, or appliances may be dispensed or supplied by the physician provided it is in the best interests of the patient The Judicial Council has expressed the opinion that it is not unethical under such circumstances for a physician to dispense drugs in his office (See *The Journal,* Nov 15, 1958 p 1556)

POST-TRAUMATIC JAUNDICE

To THE EDITOR —*Have you any reports of patients who received mild injuries for which they were not hospitalized and walked away from the scene but who subsequently developed jaundice and fibrosis of the common bile duct as a result of this injury? I have such a patient who was injured on the first of the month On the 15th, she had jaundice, and on the 21st she apparently had a fibrosis of the common bile duct Can such a patient develop a hiatus hernia?*

Martin Karr, M D , San Mateo, Calif

ANSWER —Nonpenetrating blows to the abdomen or right lower chest may injure the liver by causing lacerations of the liver substance Blood and bile collect in the injured area Transitory jaundice may occur and occasionally, hemobilia If the capsule is torn, blood and bile may enter the peritoneal cavity

It is not unusual for symptoms and signs to be delayed in appearing by four or more days Thus, after occurrence of the trauma, such persons may not appear to have received serious injuries On the other hand, I have not observed the appearance of jaundice delayed for two weeks, nor have I seen fibrosis of the common duct resulting from external trauma of this sort If the common bile duct were torn in such an injury, one would expect the prompt development of either biliary peritonitis, or jaundice, or both It is presumed that in the case cited the fibrosis was identified surgically, because otherwise the diagnosis would have to be questioned One must wonder whether the fibrosis was present prior to the injury and whether in this patient there was any actual connection between the injury and the fibrosis and jaundice Laceration of the diaphragm rarely occurs with minor external trauma

RICHARD B CAPPS, M D

ANTIHYPERTENSIVE AGENTS

To THE EDITOR —*In the treatment of hypertension what is the best drug or combination of drugs to reduce diastolic pressure, if it is assumed that both systolic and diastolic pressures are elevated and that the pathology is essential hypertension?*

Kenneth H LeFever, M D , Kingston, N Y

ANSWER —If the diastolic blood pressure is not more than 120 mm Hg, treatment with a thiazide diuretic for example, 5 mg of benzydroflumethiazide twice daily, is usually effective and may be the only drug needed Hydralazine hydrochloride, in dosages of 25 or 50 mg three or four times daily, or 0 25 mg of reserpine once daily, or both, can be added if necessary If the diastolic blood pressure is more than 120 mm Hg or does not respond to therapy with a combination of a diuretic agent and hydralazine or reserpine, or both, then guanethidine should be given, starting with 12 5 mg once daily and increasing the dose by 12 5 mg every four or five days until the desired effect is obtained Auxiliary drugs are not usually necessary when guanethidine is administered Special precautions must be taken if hypertension is complicated by cerebral or coronary atherosclerosis or by renal insufficiency

RAY W GIFFORD, JR , M D

TUBERCULOUS ENTERITIS

To THE EDITOR —*Is it possible for tuberculous enteritis to last 10 to 15 years?*

M D , Washington, D C

ANSWER —Tuberculous enteritis is practically always insidious in onset over a period of several weeks to months In the prechemotherapy era, rare cases were observed which lasted for several years Prior to the advent of chemotherapy, ulcerative tuberculosis of the intestine was common among patients with advanced pulmonary lesions The vast majority of those who died revealed extensive ulceration of the gastrointestinal tract With the use of the antituberculosis drugs, clinical evidence of tuberculous enteritis has become rare in sanitariums, but autopsy occasionally reveals ulceration among those patients who have had no chemotherapy and who are moribund on admission

Hyperplastic tuberculosis of the ileocecal region is rare in the United States but may occur in the absence of pulmonary tuberculosis It is difficult to diagnose If a chronic granuloma is reported on a tissue specimen removed surgically, it should be cultured for tubercle bacilli to prove that it is tuberculous Other granulomas, particularly fungus infections and sarcoid, may closely resemble tuberculosis on microscopic examination

MEYER R LICHTENSTEIN, M D

TETANUS TOXOID

To the Editor —*How often should a booster dose of tetanus toxoid be given to a veterinarian who is constantly exposed to* Clostridium tetani?

M D , Illinois

Answer —Tetanus toxoid immunization with necessary booster doses should be given to anyone who has continued contact with animals After primary immunization, booster doses of 0 5 ml of toxoid are recommended every four or five years, and at a time of injury This recommendation would be adequate for either constant or intermittent exposure to *Cl tetani*

E Russell Alexander, M D

NOXIOUS FUMES

To the Editor —*A 24-year-old man who installs refrigerators complained of a peculiar feeling of recurrent suffocation His vital capacity was 89% of normal, and roentgenograms of his chest showed only increased vascular bronchial markings The rest of his physical examination and laboratory studies were normal He smokes 15 cigarettes a day and is in contact with methyl chloride, fluorinated refrigerants, dichloral methane, and difloral methane Apart from discontinuing his occupation, what treatment should be tried?*

M D , Minnesota

Answer —Assuming that infections and other diseases of the lung have been ruled out, it is reasonable to suppose that the patient's complaints have been brought about by bronchial changes caused by noxious inhalants in connection with his occupation The maximum allowable concentration of methyl chloride is 100 ppm in air or 209 mg per cubic meter of air Inhalation of higher concentrations is likely to result in bronchospasm Even hemorrhages into the lung may occur after repeated exposure to it in low concentrations The other refrigerants mentioned may also provoke bronchospasm when inhaled in concentration higher than their maximum allowable concentrations Moreover, when subjected to high temperature, they decompose with the formation of free halogens, hydrogen halides, and carbonyl halides which are toxic and irritating

In this case, the feeling of recurrent suffocation is attributable mostly to bronchospasm Administration of antihistamines is not recommended unless a definite allergic cause has been established Although these drugs may cause bronchial relaxation, their effect is not as reliable as that of adrenergic remedies The use of Lugol's solution is objectionable The rationale of its administration as an expectorant lies in the fact that it is excreted partly through the glands of the bronchial mucosa The resulting stimulation of these glands is followed by increased secretions and, possibly, in loosening of a thick, tenacious exudate which is adherent to the bronchial wall Large doses may cause excessive hyperemia of the mucosa, profuse secretions, and bronchospasm

Better results can be anticipated from the use of such bronchospasmolytic drugs as isopropylepinephrine, phenylephrine hydrochloride, ethylnorepinephrine hydrochloride, and a 2 25% solution of racemic epinephrine hydrochloride, longer acting epinephrine (epinephrine in oil, aqueous epinephrine suspension), ephedrine, and ephedrine-like compounds, including racemic ephedrine hydrochloride, methoxyphenamine hydrochloride, phenylpropanolamine hydrochloride, and aminophylline

Andrew L Banyai, M D

SUICIDAL ASPHYXIA

To the Editor —*Could an adult who is fully oriented end his life by means of a plastic bag held tightly around his throat?*

M D , Pennsylvania

Answer —I take the question to imply that the plastic bag is drawn over the head, before being held tightly at the throat, rather than merely used as a tie around the throat The question then is a variation of the old one could a person voluntarily hold his breath until dead? In the latter case, the answer must be "no", for, even with sufficiently great will power to inhibit breathing up to unconsciousness – which is doubtful – unconsciousness would abolish the cortical inhibition before it abolished the medullary breathing reflexes

The present case is by no means so clear If a person could hold his breath to unconsciousness, he would hardly be able to free himself of the bag and again have easy access to fresh air Assuming the more likely outcome, that the drive to breathe would overcome the determination to die, before unconsciousness set in, the question then is would the subject still be able to remove the bag and breathe successfully, or could he push himself so near collapse that unconsciousness supervened before he could get himself released from the bag?

The answer would probably depend on how difficult it is to extricate oneself With a sufficiently strong bag and a sufficiently tight tie, or other interference with easy removal, I should think death would be possible This would almost certainly be true if the subject had included some carbon dioxide absorbent in the bag, so that oxygen tension could fall without an equivalent rise of carbon dioxide

R W Gerard M D

MENSTRUAL CYCLE

To THE EDITOR —*Have any studies been made to uncover the relationship between the lunar month and the menstrual cycle? If so what have been the conclusions?*

Edward Dengrove, M D , Asbury Park N J

ANSWER —The average normal menstrual cycle happens to approximate the lunar month, and many efforts have been made to correlate the lunar phases with the woman's monthly cycle From the Latin word mensis (month) we have the term menses" meaning menstrual periods or monthlies Repeated statistical efforts have failed, however, to correlate the lunar months with menstrual cycles

EDMOND J FARRIS, PH D

THE MOAN TEST FOR AMEBIASIS

To THE EDITOR —*The Question and Answer section of* THE JOURNAL *June 11, page 740, contained a statement concerning the Moan test for amebiasis in answer to a question by Dr H B Eisenstadt of Port Arthur, Texas Your reply dealt, primarily, with the precipitin test which was given a limited circulation for research purposes only It was found to be accurate in the hands of technicians trained specifically in its use and interpretation It was not made generally available because of the difficulty experienced in obtaining proper readings of the results by technicians not thoroughly familiar with the nuances of the test*

The Moan hemagglutination test referred to in the last paragraph of your reply to Dr Eisenstadt is a modification in technique which permits accurate and objective readings of the reaction by average laboratory technicians while retaining the sensitivity and specificity of the precipitin test My paper, comparing the results between the two procedures has been submitted to Gastroenterology *for publication*

Your only citation concerning the precipitin test is that of McHardy Unfortunately, McHardy s evaluation was based on the use of antigen which, unknown at the time to Dr McHardy or this laboratory, was contaminated by a precipitate obviating the possibility of accurate results Additional publications on the precipitin test include Babione s reply to McHardy (Gastroenterology *33 123, 1957), Madureira and Frye* (Rev Med Cir [São Paulo] 17 *no 17, 1957), who found no false positive, two doubtful positive, and one false negative result in 50 cases of active amebiasis and one doubtful positive result in 50 cases negative for* Entamoeba histolytica, *and Farfel* (Amer J Gastroent 32 620, 1959) *who described a patient with serous choroiditis identified as amebic in origin by the Moan test, who subsequently recovered her sight on antiamebic therapy*

We have talked to Dr Frye concerning McHardy's reference to his "independent evaluation" He stated that he has published nothing on the precipitin test

From our correspondence since the publication of the June 11 issue of THE JOURNAL *there have been two types of response to the article Members of the medical profession not familiar with the Moan test are skeptical of its value and hesitate to use it in their diagnostic procedure, in spite of the known need for such a test We have, however, received a greater number of responses from those doctors who have successfully used the Moan test in their practice with beneficial results These physicians have expressed a fear that your reply to Dr Eisenstadt may have seriously delayed the general use and acceptance of a valuable diagnostic tool by the medical profession*

We believe that your respondent s reply to Dr Eisenstadt was given in all sincerity on the basis of the professional information that was available and known to him at the time of his reply However, in view of the favorable publications cited above and the accepted use of the Moan test by practicing physicians throughout the United States, we would appreciate a review and enlargement of your reply to Dr Eisenstadt, citing the favorable research so that members of the medical profession may be fully informed with respect to the value and benefit to be derived from use of the test

Mrs Jeanne C Moan
Mobac Laboratories
2300 Garrett Rd
Drexel Hill, Pa

The above comment was referred to the chief of the Laboratory Branch of the Communicable Disease Center, Atlanta, Ga , and his reply follows

To THE EDITOR —*A limited evaluation of the Moan hemagglutination test for amebiasis, with use of the reagent that is commercially available from the Mobac Laboratories, Inc, has been performed at the Communicable Disease Center of the U S Public Health Service The results of this study have been submitted for publication It was found that when the test was performed according to the instructions accompanying the Moan antigen, there appeared to be no correlation between the presence or absence of ameba antibodies in the serums tested and the results obtained Similar agglutinations were observed when serums were mixed with erythrocytes coated with antigen and erythrocytes without antigen This reaction does not occur when saline solution is substituted for the serum, indicating* *the possibility of a Forssman or heterophile type of reaction It would appear, therefore, that the Moan test, in its present form, is not specific for amebiasis*

Ralph B Hogan, M D
Medical Director
Chief, Laboratory Branch
Communicable Disease Center
Atlanta, Ga

MUSCULAR CRAMPS

To the Editor —*In reading a recent issue of* The Journal, *I was intrigued by the question raised by Doctor Douglass as to treatment for severe nocturnal cramps in the feet and legs, particularly of older people I agree with the reply that such cramps are often difficult to relieve, but I have been amazed at a number of patients who have been greatly benefited by calcium gluconate The calcium must, however, be taken on an empty stomach or it is relatively ineffective I usually give 1 Gm of calcium gluconate at 10* a m *and 1 Gm at 4* p m *If that does not work, I prescribe quinine, but it has not been as successful as the calcium gluconate*

Philip W Brown, M D
Mayo Clinic
200 First St , S W
Rochester, Minn

The above comment was referred to the consultant who answered the original question, and his reply follows —Ed

To the Editor —*Although calcium gluconate has been a textbook remedy for many years for idiopathic leg cramps, it has been remarkably ineffective in my experience, and I have abandoned its use Quinine has been the most consistently effective medication for this condition in my opinion*

APHTHOUS STOMATITIS

To the Editor —*Reference is made to the question on aphthous stomatitis posed by H L Tindall, M D , which appeared in* The Journal, *Aug 6 page 1619 Several years ago I ceased seeking the cause and cure of this most annoying condition with which I was personally afflicted when I discovered how I might avoid or precipitate an attack of these ulcers Certain foods will always produce an aphthous ulcer in my mouth between 48 and 72 hours after ingestion These foods include chocolate, potato chips, and salted nuts Certain other foods will also act as offenders By avoiding this class of foods, I remain free of ulcers which formerly troubled me as often as weekly*

My interpretation, I must confess, leaves much to be desired from a physiologist's point of view Ingestion of foods that have been fried in deep fat, when cooled and packaged, may contain certain stearates which undergo changes while they sit on store shelves and age This appears to be true of bags of salted nuts, potato chips, and other products which may not be consumed for weeks after packaging

Chocolate is included as an offender because the cocoa-butter content of chocolate is a compound containing stearates Chocolate, too, is a food which may remain on the shelf for long periods I have, therefore, classed as offenders all foods which contain stale stearates

Advice on the most effective treatment for the individual ulcer was given me by the late Frank Regan, D D S , of Cleveland His procedure was as follows Wipe the ulcer dry Protect the field against saliva for the minute or two that treatment is administered Moisten the distal half-inch of an applicator that has been whittled to about one-half its original diameter in fuming nitric acid, and then touch the center of the ulcer The pain is not intense, the center of the ulcer will discolor as it undergoes desiccation Contact for 30 seconds is sufficient to complete the cautery The area is then sponged or rinsed to remove any excess acid The acute pain of the ulcer disappears by the time the treatment is completed, and there is no longer any awareness of the presence of the ulcer

J G Rosenbaum, M D
2460 Fairmont Blvd
Cleveland Heights 6, Ohio

The above comment was referred to the consultant who answered the original question, and his reply follows —Ed

To the Editor —*If as suspected, aphthous stomatitis is viral in origin, it would be difficult to explain the effect of diet on the eruption In some persons it is known that a certain food or foods will trigger the disease The theory of stale stearates advanced by your correspondent requires confirmation For instance, ingestion of the suspected food while fresh would be the first step in such investigation, if the aphthae fail to appear, then, obviously, staling could be a factor If the aphthae still appear after ingestion of fresh food, then, just as obviously, staling has no causative role*

The described treatment with nitric acid may be effective in some patients Caustic applications for aphthous stomatitis have always been listed as appropriate therapy and include such remedies as 10 per cent silver nitrate, powdered alum, and chromic acid

Seymour J White, M D

ABSTRACTS FROM THE LITERATURE

Archives of Internal Medicine

106 608 662 (Nov) 1960

Dialysis in Treatment of Chronic Renal Failure
W A Kelemen and W J Kolff p 608
*Intravenous Fat Emulsions and Human Blood Viscosity
M A Shearn and A Gousios p 619
*Polycythemia Vera
P G Rigby and B S Leavell p 622
Totally Asymptomatic Myocardial Infarction Incidence in Population—H A Lindberg and others p 628
*Apoplexy of the Lesser Omentum
L Pelner and N Mitchell p 634
*Prolonged Venoarterial Pumping for Circulation Support
J F Dickson III J W Dow and N A J Hamer p 639
*Phlegmasia Cerulea Dolens
G B Reams and M C Rosner p 647
*Hemophilus Influenzae Meningitis in an Adult
D E Holdsworth p 653
Postural Hypotension in Anhidrosis and Unchanging Pulse
M Razavi A R Nelson and J Picchi p 657

Intravenous Fat Emulsions and Blood Viscosity—The effect of intravenously administered fat emulsion on the viscosity of human blood was investigated because (a) hyperlipidemia in animals has been shown to result in increased blood viscosity and (b) increased blood viscosity has been implicated in the pathogenesis of thrombosis Since, in man, major thrombotic episodes occur in vessels of medium caliber (coronary or cerebral arteries, femoral vein, etc), we determined blood viscosity by a simple reproducible technique that utilized laminar flow, thus more accurately reflecting the situation in medium-sized vessels In 13 subjects blood viscosity was determined before and after injection of 600 ml of an emulsion containing 90 Gm of lipids All sera became turbid In some instances the total blood lipid content increased 3 fold In spite of the magnitude of this rise, blood viscosity showed no significant change

Polycythemia Vera—The course and prognosis of patients with polycythemia vera, and especially the relationship of complications to surgical procedures, have not as yet been accurately established In our retrospective study of 50 cases, including 23 patients followed until death, therapy with marrow inhibitors (radioactive phosphorus, x-ray) was associated with an increased survival time and fewer vascular complications Five of 15 patients who underwent surgery had hemorrhagic or thrombotic complications following both major and minor procedures Three of these 5 patients had a preoperative hematocrit of 55 per cent or greater, whereas only 1 of 10 patients surviving without complications had a hematocrit greater than 55 per cent Therefore, we have concluded that the optimal treatment of patients with polycythemia vera is with marrow inhibitors, and that these patients should be treated and brought under control prior to any surgical procedure whenever possible

Apoplexy of the Lesser Omentum—Within a few years, 2 female patients were seen in a small general hospital with localized apoplexy of the lesser omentum In both instances there was a sudden onset of severe epigastric pain, not accompanied by vomiting, heartburn, or belching Following this these patients had difficulty straightening up or walking There was no previous history of a similar attack or of any abdominal injury X-ray examination did not reveal any definite abnormalities in the stomach The preoperative diagnosis was perforating peptic ulcer, although a secondary diagnosis of acute cholecystitis was entertained Both patients had a fever of 101°F, an elevated white blood cell count (about 12,000), with 73 to 80% polynuclear cells and 5% monocytes Both cases at operation showed a mass consisting of inflamed lesser omentum which was closely adhering to the lesser curvature of the stomach at the pars media and a partial gastrectomy was done Microscopic examination revealed in each case that the omental fat was diffusely infiltrated with erythrocytes, and an inflammatory response was noted, near the serosal lining of the omentum and extending into the regional tissue, early granulation tissue with spindle-shaped fibroblastic cells was present, and small capillary formations were also observed

Prolonged Veno-Arterial Pumping as Support—In potentially irreversible conditions with a diminished cardiac output, such as myocardial infarction or pulmonary embolus, mechanical support of the circulation for a number of days may be useful A closed system has been devised for withdrawing blood from the superior vena cava and pumping it into the aorta at the bifurcation by means of peripheral cannulation, with the intention of supporting the patient through the period of crisis by increasing the arterial blood pressure, increasing the blood supply to the heart muscle, and decreasing the pulmonary hypertension It has been employed in the dog for 52 hours and clinically for 26 hours without ill-effects

Phlegmasia Cerulea Dolens—This case report describes the development of phlegmasia cerulea dolens in a young white male The diagnosis and treatment in this case are outlined in detailed fashion and the literature is reviewed The recognition of this entity is of extreme importance, first in preventing an unnecessary exploration for arterial obstruction and later in preventing a needless amputation since in almost all cases the resulting gangrene is of a superficial nature Therapy in this case consisted of sympathetic blockage, anticoagulants, and antibiotics Outcome was favorable and complete restoration of function of the affected leg was achieved There is a marked variation of opinion in the literature concerning the pathologic physiology as well as the therapy of this condition It is hoped that this report will help to emphasize the salient features of this not uncommon but incompletely understood disease process

Hemophilus Influenzae Meningitis—The 36th reported case of *Hemophilus influenzae* meningitis in an adult is presented A 63-year-old white female developed progressive stupor and coma without focal neurologic or meningeal signs after 2 days of malaise and confusion No endogenous source of infection was apparent. An asymptomatic carrier, her grandson was thought to be the source of infection Despite 80

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Titles marked with an asterisk (*) are abstracted

hours of coma and evidence of overwhelming infection, complete recovery ensued by the 5th day as a result of therapy with penicillin, sulfisoxazole, and chloramphenicol (Chloromycetin) in conjunction with adrenal steroids One episode of gastrointestinal bleeding occurred and was attributed to the use of steroids In a case of overwhelming infection of the meninges, triple antibiotic therapy in combination with adrenal steroids proved to be life-saving

Archives of General Psychiatry

3 451-567 (Nov) 1960

°Stress Response in Chronic Psychiatric Patients
D Oken and others p 451
°Factor Analytic Study of Multivariate Psychosomatic Changes Over Time—H A Heath and others p 467
°Community Psychiatry as Opportunity for Medical Leadership
M Ross p 478
°Function of Music in Spontaneous Art Productions
D Offer and D Stine p 490
°Deterioration After Electroconvulsive Therapy for Intracranial Meningioma—M M Gassel p 504
°Family Dynamics in South Italian Schizophrenics
A Parsons p 507
°Metabolic Studies in Childhood Schizophrenia II
C R Shaw and H E Sutton p 519
°Method for Clinical and Theoretical Study of Earliest Memory—R J Langs and others p 523
°*The Monster Test*
E Lehman p 535
°The "Pharmacogenic Orgasm" in the Drug Addict
R D Chessik p 545
°Association of Preadmission Symptoms with Social Background of Mental Patients—E L Linn p 557
°Experience of Time as Determinant of Self-Control
D C Thompson, G Spivack and M Levine p 563
°Chemotherapeutic Trials in Psychosis V Septal Extract
W J Turner, W Krumholz, and S Merlis p 567

Stress Response in Psychiatric Patients —Psychophysiological responses to a stressful situation were studied in 10 chronically ill male "borderline" patients whose major complaint was depression Heart rate, blood hydrocortisone, affect ratings, and other indices were measured before, during, and after a stressful interview conducted during intravenous administration of curare or placebo Study of the subjects revealed an entrenched pattern of avoidance and shutting out of all stressful stimuli, giving the appearance of bland unresponsivity Nevertheless, the interviewer penetrated their defenses, with resultant brisk elevation of psychological and physiological variables As contrasted with acutely ill patients, responses were sharply limited to the stress period, which seems meaningfully related to the defensive maintenance of *status quo* Although it was anticipated that curare would block motility generally, it did not do so, nor did it prove a stressful stimulus

Factor Analytic Study of Psychosomatic Changes —A method which permits the use of factor analysis for research involving repeated testing occasions was described and applied to psychosomatic data obtained from 8 chronically depressed patients who participated individually in 7 experimental sessions which yielded scores on 27 variables These included psychiatric ratings of affect, biochemical determinations, cardiovascular and respiratory indices, surface electromyographic readings, and 2 independent stress-inducing measures Scores were standardized for every variable separately for each subject on the basis of his own mean and sigma, and were combined across subjects to form distributions for intercorrelations The rationale for this deviation from the usual factor analytic procedure was discussed Ten factors were extracted and rotated to simple structure The cardiovascular, respiratory, and motor measures tended to load with one or more of the affects, whereas the biochemical variables remained independent

Community Psychiatry and Medical Leadership —Psychiatry since World War II has been part of a sweeping movement to find community substitutes, alternatives, and reinforcements for the public mental hospital The movement is loosely called "social psychiatry " Under its banner, psychiatry has sought integration with the rest of medicine (particularly general practitioners), with behavioral scientists, and with a wide spectrum of community agencies and leaders Pending discovery of specific cures and prevention for the mental illnesses, the profession adjudges social psychiatry to be its best bet It offers new opportunities for medical leadership It also harbors some threats to the identity of the psychiatrist as a physician The paper suggests the nature of the opportunities and the threats It emphasizes the need for assigning priority to those community psychiatric programs which reflect a consensus of opinion in the medical profession as to their soundness

Music in Spontaneous Art Productions —This study was an effort to determine the effect of different types of music on drawings of schizophrenic subjects, neurotically depressed subjects, and control subjects Three objective judges were given criteria by which they independently scored each of the 108 drawings produced The scores were examined by the analysis of variance to determine differences between diagnostic groups, between types of music, and between the order in which the musical stimuli were presented The major findings were that schizophrenic subjects failed to respond to musical stimuli, whereas the depressed and the control subjects responded differentially, on the other hand, the schizophrenic subjects were the only ones who responded significantly to the order in which the musical stimuli were presented

Deterioration After Electroconvulsive Therapy for Intracranial Meningioma —Three of 250 consecutive cases with intracranial meningioma admitted to the National Hospital, London, had a history of psychiatric disorder for which E C T was given before correct diagnosis was made In each case it was followed by deterioration in the patient's condition, the appearance of papilledema, and other physical signs It was concluded that deterioration was accelerated by E C T , and that it was representative of the effect of E C T on patients with intracranial meningioma The few similar cases reported were reviewed Some had symptoms which, in retrospect, might have suggested the correct diagnosis The report stresses the danger of E C T loosely prescribed and suggests that deterioration in the patient's condition and the appearance of physical signs after E C T should be treated as presumptive evidence of space-occupying disease of the central nervous system

Family Dynamics in South Italian Schizophrenics — A study of 25 schizophrenic women was undertaken in southern Italy One aim was to discover whether or not family patterns similar to those encountered in the study of families of schizophrenics in the United States could be discerned Given the centripetal nature of the south Italian family, it was felt that symbiotic ties to intimates would be more characteristic of the adolescent and adult history than would extreme isolation In actual fact a variety of patterns appeared Nine patients had close, reciprocated ties to one parent at some cost to other family relationships but an additional 9 appeared somewhat inhibited and isolated even within the family circle Two prepsychotic personality patterns were distinguished the 'quiet and good and the jealous and capricious The former occurred predominantly in large families and the latter in small ones

Childhood Schizophrenia II —It is not finally certain that childhood and adult schizophrenia are the same disease However, present evidence, including genetic studies, follow-up studies and comparisons of basic psychopathology, indicates that they probably are the same Child schizophrenics are valuable as subjects for research in metabolic studies of schizophrenia, since they apparently represent the disease in its early form, and can thus clarify cause-effect relationships Amino acid excretion patterns have been reported to be abnormal in adult schizophrenia In the present study, these amino acids were determined chromatographically in the urine of 10 schizophrenic and 12 nonschizophrenic children valine, leucine, tyrosine, alanine, lysine, threonine, glycine, taurine serine, and beta-aminoisobutyric acids No significant differences were found between the schizophrenics and the controls Since adrenal cortical activity affects amino acid secretion this is probably not altered in childhood schizophrenia

Method for Study of Earliest Memory —A manual for scoring the manifest content of the first childhood memory was introduced by application to the earliest memories of 20 hospitalized women half diagnosed as having hysterical character disorders (H) and half as paranoid schizophrenics (S) The scoring items produced these simple preliminary findings H memories were grossly traumatic with frequent themes of punishment and illness H person roles were predominantly hostile These memories were action oriented and rich in thematic content, with emphasis on references to body parts appearances, rejection, and morality S memories contained less interaction and more unclear roles and settings They were thematically more barren, with themes of happy occasions predominant S memories were more disconnected and more lacking in full contact with reality than the H, but connected, reality-oriented memories predominated within the S group *per se* The earliest memory appears to be grossly related to clinical diagnosis, and the scoring of manifest content seems to be psychologically meaningful

The Monster Test —A test has been devised that is simple to administer and to score, and which may be easily included in a psychiatric examination This test uses the proverb, Two heads are better than one, to probe a patient's ability to abstract, to determine the strength of his human body image, and to evaluate the quality of his reality testing Not only an oral response is obtained but also, and of even more importance, a drawing illustrating the patient's interpretation of this proverb So far, 550 psychiatric patients between the ages of 6 and 16 years have been tested In almost 60% of psychotic youngsters and in less than 10% of nonpsychotic ones, the test evoked the concept of various types of monsters Of 250 patients both psychotic and nonpsychotic who gave a monster response over 90% were diagnosed psychotic The general rule is that normal responses are not evidence against psychosis, but that, with infrequent exceptions, monster responses are obtained only from the psychotic The test was of value not only in the diagnosis of psychosis in children under 16 years but also when the I Q was above 50, in differentiating some pseudodefective psychotic children from true mental defectives

'Pharmacogenic Orgasm" in the Drug Addict —Fifty male heroin addicts at the U S Public Health Service Hospital, Lexington, Ky were studied by psychiatric interview and by psychological testing The pharmacogenic orgasm, or specific experience reported by the addict following intravenous injection of opiate drugs before physiological dependence has developed, was examined in more detail than in previous studies Changes in the patients psychic life after withdrawal from drugs, with focus on his memories, dreams, and longings for the pharmacogenic orgasm were also investigated The pharmacogenic orgasm seems to contain the psychological elements of euphoria and the phantasy of reunification with the mother or of reexperiencing the sensations of warmth and tenderness longed for from her Physical sensations reported paralleled this and centered in the stomach, and sometimes in the skin and genitals Ancillary activities during the pharmacogenic orgasm and substitutive activities when drugs could not be obtained, consisted of regressive oral incorporative activities or sexual arousal accompanied by oral incorporative phantasies An attempt is made to clarify the psychodynamic meaning of these phenomena

Preadmission Symptoms and the Background of Mental Patients —We studied reports of symptomatic behavior before hospitalization as narrated to hospital psychiatrists by families or friends of patients It was expected that such behavior occurring in the presence of others, would reflect the social conditions and manner of life of these patients Hospital charts of all functional psychotics, aged 20 through 49, of both sexes, white and Negro, admitted to a mental hospital for the first time, were our source of data We found that the types of symptoms reported were not associated, for the most part, with the education, marital status, religion, or other normal characteristics of patients In contrast, some behavior of patients (drinking church attendance, hobbies or interests) reported as usual for them before the onset of symptoms, were associated with their education, race, and sex We inferred that the usual behavior of patients before the onset of symptoms reflected their social background, but the type of symptomatic behavior manifested, for the most part, did not

Experience of Time as Determinant of Self-Control —Is tolerance of a tension-inducing task dependent upon the subjective sense of time passing? Eight normal female adults were trained to have a fast subjective clock and 8 others were trained to have a slow subjective clock. Performances on a task inducing muscular tension were compared before and after time training Compared with 8 control cases the fast-clock group demonstrated less tolerance for the task, while the slow-clock group showed more tolerance Differences between groups were statistically significant The implication of these results is that not only can temporal experience be experimentally manipulated but that one can thereby alter other behaviors This places psychological time in a position equivalent to that of time in relativity theory

Chemotherapeutic Trials in Psychosis V Septal Extract — Septal extract prepared according to the methods of Heath was studied in 39 schizophrenic subjects Nine separately prepared extracts were examined in double blind procedures, injections being continued for a minimum of 30 days In no instance was significant change observed

Acta Paediatrica, Uppsala

49 329-464 (July, part 1) 1960 Partial Index

The Electrocardiogram at Birth
L Stern and J Lind p 329
°Marbleization and Perinatal Anoxia
P E Sylvester p 338
Respiratory Studies in Newborn Infants
P Karlberg and others p 345
Problem of Congenital Hemopathies
J Bjure and others p 358
Iodine Content of Human Milk in Finland
P Lahesmaa and P Vilkki p 371
°Indications for Exchange Transfusion in Newborn
Infants—A Killander and others p 377
Studies on Osteopetrosis III
B Engelfeldt and others p 391

Marbleization and Perinatal Anoxia—A report is presented on the clinical and pathological findings in 3 mentally defective children who died between the ages of 11 months and 3 years The 1st had athetosis associated with spastic diplegia, the 2nd had spastic quadriplegia, and the 3rd had epilepsy associated with choreiform movements and spastic diplegia There was a history of perinatal anoxia due to circulatory obstruction of the umbilical cord in all the children Autopsy revealed a small brain in all 3 children, in 2 significant marbleization was found in the thalamus, the putamen and globus palladus, and also loss of nerve cells in the cortex insula and horn of Ammon Gliosis was present in the reticulated area of the substantia nigra and the inferior olives, and there was increased periventricular gliosis Staining characteristics showed that the damage in these areas had resulted in dense gliosis In 1 child damage to the thalamus and basal ganglia was also present but to a lesser extent, and multiple foci of gliosis were seen in the gray matter of the frontal and parietal cortex

Exchange Transfusion in Newborn Infants—A study was made with special regard to initial hyperbilirubinemia, intellectual and physical development, and the possible occurrence of neurological signs in a series of 94 full-term newborn infants with hyperbilirubinemia not related to isoimmunization Exchange transfusion was performed in 46 of these, and no transfusion was given to 48 who served as controls At the age of 3 to 4 months all the infants were healthy, and no difference was found between those who were given exchange transfusion and the infants in the control group There were 23 premature infants with hyperbilirubinemia, 10 of whom manifested neurological signs In 7 of these, marked improvement was noted immediately after the exchange transfusion and 3 were slightly improved None of these infants showed signs of kernicterus at the age of 3 to 4 months as compared with the findings in 1954, when 6 premature infants died from kernicterus These results indicate that exchange transfusion offers a reliable means of preventing kernicterus in premature infants It seems, however, to be unnecessary at a bilirubin level of 20 mg per 100 ml in full-term infants with hyperbilirubinemia not caused by isoimmunization

49 465-550 (July, part 2) 1960 Partial Index

°Juvenile Nephronophthisis I Genetically Determined
Nephropathy—O Broberger and others p 470
Juvenile Nephronophthisis II Histologic and Microangiographic Study—B I Ivemark and others p 480
Blood Flow in Foot and Calf of Newborn Plethysmographic Study—O Celander p 488
°Chronic Pancytopenia with Multiple Congenital Abnormalities (Fanconi s Anemia)—L R Nilsson p 518

Genetically Determined Nephropathy—The records of 7 patients (6 girls and 1 boy between the ages of 6 and 16 years) with nephronophthisis are analyzed and the clinical and biochemical characteristics of the disease are discussed Reasons for hospitalization were albuminuria in 2 patients, anemia in 2, persistent elevated erythrocyte sedimentation in 1, tetany in 1, and family history in 1 The general condition was good in 6 patients at the time of admission The clinical symptoms, with polyuria as the early characteristic, were uniform and similar to what has been described as familial juvenile nephronophthisis Defective water reabsorption was the only regular sign of tubular dysfunction Low serum levels of sodium and chloride were observed in some patients, probably as a consequence of tubular damage Osteodystrophy was a prominent feature The characteristics of the renal disease suggested that the skeletal abnormalities were related to the azotemic state and not primarily to renal tubular dysfunction The course of the disease suggested an ascending degeneration of the nephrons Five patients died The disease is genetically determined, probably inherited as an autosomal recessive gene, and the heterozygote may be detected The initial renal tubular dysfunction may be called "water-losing nephropathy Since patients are usually in good general condition at the onset, and since albuminuria, erythrocyturia, edema, and arterial hypertension are either absent or mild, a diagnosis of renal disease may be delayed for many years after the appearance of the first symptoms

Chronic Pancytopenia with Multiple Congenital Abnormalities—Three new cases of Fanconi s anemia are reported and the characteristics of the disease are discussed in a review of 82 cases reported in the literature The 1st of the author s patients was a 7-year-old boy with the typical clinical picture of chronic pancytopenia, abnormal pigmentation, stunted growth, deformities of the upper limbs, small genitalia, and kidney abnormalities The patient was treated with repeated blood transfusions Splenectomy was suggested but refused by the parents The boy died at home at the age of 9 years and 4 months The 2 other patients, a sister and brother aged 7 and 3½ years respectively, showed no other abnormality than blood changes The girl suffered from skin hemorrhages and had a distinct precordial systolic murmur Findings from blood tests were interpreted as thrombopenic purpura and the patient was treated with ACTH and cortisone without any results The boy had pronounced thrombocytopenia, mild anemia, and leukopenia As the condition of these 2 children remained stationary, splenectomy was not attempted Most cases of Fanconi s anemia show a familial background Symptoms of blood dyscrasia are noted in childhood and the course usually leads to a fatal issue within a few years

Acta Psychiat Scand, Copenhagen

35 261-402 (no 3) 1960 Partial Index

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C -M Idestrom p 302
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°Stereotactic Pallidal Thermolesions in Parkinsonism
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Stereotactic Pallidal Lesions in Parkinsonism—The authors report on 81 patients, 30 to 75 years of age, with Parkin sonism who were operated on in the department of neurosurgery of the University Hospital, Lund, Sweden, between 1953 and 1957 Lesions were made in the region of the globus pallidus by high frequency alternating current applied to a pair of electrodes under control of the tissue temperature The optimal site for the target point was found to be on the posteromedial aspect of the medial nucleus of the pallidum, just anterior to the internal capsule and 20 mm from the midline The postoperative follow-up varied from 1 to 5 years Lasting relief of both rigidity and tremor was obtained in 62 (77%) of the 81 patients Relief of rigidity alone was obtained in 64 patients (79%) and of tremor alone in 67 patients (82%) In the remaining patients the operation had little or no effect Salivation and dysarthria were not influenced The degree of physical and social incapacity was considerably diminished, 25% of those patients who had been unemployable before were able to work after the operation and 66% of those who had been completely incapacitated achieved useful activity There was no operative mortality, but 2 patients died at home 3 months after the operation, 3 patients had transient hemiparesis 1 had transitory hemiplegia and an epileptic attack and 3 had epileptic attacks postoperatively A slight transitory facial paresis was observed in 44 patients Marked cerebral atrophy is a contraindication to operation The operation should not be performed in patients over 70 years of age or in those in a far advanced stage of the disease

American Journal of Hygiene, Baltimore

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Volatile Amines in Stools of Infants with Gastroenteritis
U Bachrach and others p 1
*Epidemic of Inhalation Anthrax First in 20th Century
II Epidemiology—P S Brachman and others p 6
Bacillus Anthracis Aerosols in Goat Hair Processing Mills
C M Dahlgren and others p 24
Serologic Testing for Anthrax Antibodies in Workers in
Goat Hair Processing Mill—P S Norman and others p 32
Staphylococcal Infections in a General Hospital
S M Farrer and C M MacLeod p 38
Complement Fixing Antigen for Herpes Simplex from Chick-
Embryo Tissue Cultures—N J Schmidt and others p 59
Japanese B Encephalitis Virus in Organs of Infected
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Distribution of Multiple Sclerosis in U S Veterans by
Birthplace—E D Acheson and C A Bachrach p 88
Evaluation of Adenovirus Vaccine in Dispensary Population
R A Stallones and others p 100

Epidemic of Inhalation Anthrax —The authors report observations on 5 patients with inhalation anthrax and 4 with cutaneous anthrax, who contracted their infections during a 10 week period in 1957, in a New Hampshire goat hair processing mill No case of inhalation anthrax had been seen at this mill before the epidemic although 136 cases of cutaneous anthrax had been reported during the preceding 16½ years Four of the patients with inhalation form of anthrax worked in departments that handled the hair in its rawest state (picking scouring, blending and card-combing) Anthrax organisms recovered from patients were tested by respiratory route in animals and were found to be highly virulent Virulence was enhanced by a detergent which had been introduced into the scouring process shortly after onset of the first case Anthrax vaccine containing alum-precipitated protective antigen appeared to afford protection, but this impression could not be confirmed statistically since previous inapparent infection also may have protected some of the workers Samples of air from the card-comb room showed excessive dust content and large numbers of anthrax spores at least during part of the epidemic period *Bacillus anthracis* was cultured from 50% of the goat hair A time association was found between the onsets of the cases and the processing of a particular lot of Indian goat hair Although the epidemic of inhalation anthrax could not be completely explained, 2 hypotheses (possibly interrelated) are consistent with the data (1) that particular lot of hair may have been greatly contaminated with anthrax spores resulting in an excessive concentration of an infective aerosol in the dustiest areas of the mill or, (2) the hair may have contained organisms of unusually high virulence

Annals of Internal Medicine, Lancaster, Pa

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*Shunt Encephalomyelopathy II
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Homologous Serum Hepatitis
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Percutaneous Needle Liver Biopsy in Neoplasia
R S Nelson and D S J Salvador p 179

Adrenocortical Steroids in Infectious Diseases —Eighty-one selected patients were treated with steroids in the clinics of the University of Minnesota Medical Center Minneapolis from 1950 to 1959 They were divided into 2 groups The 1st consisted of 38 patients with an infection and peripheral vascular collapse (acute bacterial shock) 25 of whom had vascular collapse due to gram-negative endotoxin Although 23 (60%) of the 38 died large doses of steroids did contribute to the recovery of certain patients It is recommended that 500 to 1000 mg of hydrocortisone be administered intravenously within the first 24 hours Subsequently, hydrocortisone or one of the analogues can be given orally, often in smaller doses and for a few days only Clinical observations have been substantiated by studies on experimental endotoxin shock in laboratory animals The 2nd group of patients treated with adrenal cortical steroids consisted of 34 with inflammation occurring during the course of an infectious disease and of 9 patients with severe drug reactions Inflammation can be especially harmful when certain organs, such as the heart, are involved or when the central nervous system is the site of reaction Steroid therapy has been effective in selected patients with tuberculosis brucellosis infectious mononucleosis, the complications of mumps (which include orchitis, purpura, and encephalomeningitis) acute rheumatic fever, hepatitis and trichinosis and in patients with severe drug reactions, especially to penicillin In the selective use of steroids in infectious diseases large doses of adrenal cortical steroids should be given to seriously ill patients for a short time No undesirable side-effects have been observed when these criteria have been followed The benefits have far outweighed the possible hazards

Shunt Encephalomyelopathy II—The authors report on 2 men, 53 and 38 years of age, with cirrhosis of the liver who had repeated attacks of coma chiefly due to protein intolerance after gastrectomy and successive portacaval shunt operations Both patients died, but permission for autopsy was obtained only for the older patient The most consistent finding was the widespread and profuse proliferation of Alzheimer's type 2 glial cells The striking feature from a neuropathological standpoint was the selective demyelination in the spinal cord limited to the pyramidal tracts The involvement extended no higher than the cervical cord and became progressively more marked caudally Both of the patients had marked protein sensitivity which progressed with time, so that body protein depletion and wasting were inevitable Gastrectomy probably acted primarily as an intensifier of the effects of the portacaval shunt The spinal cord lesion is believed to be a metabolic effect of some protein breakdown product ordinarily removed or modified by the liver but, in these patients, shunted around the hepatic cells The cases of 2 patients with spinal cord demyelination in association with portal-systemic shunting were collected from the literature In addition to the cord changes the findings in these patients, however, were of hepatolenticular degeneration, but not Wilson's disease

Protection and Reconditioning of Heart Muscle—Lack of habitual exercise, an outstanding characteristic of present-day Western civilization, produces a statistically demonstrable sympathetic-adrenergic preponderance in the autonomic nervous regulation of cardiac dynamics at rest ("loafer's heart" or "detrained heart"), in contrast to the well known vagotonic and/or sympatho-inhibitory features of "athlete's heart" These shifts in the autonomic nervous equilibrium are reversible by physical training and by prolonged lack of exercise, respectively Although a moderate degree of adrenergic overactivity in itself may not injure an otherwise healthy heart muscle, the potentially cardiotoxic metabolic properties of the adrenergic catecholamines (oxygen wastage, impairment of energy efficiency, production of local hypoxia and necrotization) are greatly intensified if they coincide with such common vulnerability-increasing conditions as coronary sclerosis, arterial hypertension, cardiac hypertrophy, and certain hormonal and vitamin derangements Statistical and experimental observations suggest that inactivity-induced adrenergic preponderance contributes significantly to the high cardiac morbidity and mortality in overcivilized Western nations, even though the statistical picture is somewhat blurred by the common coincidence with atherogenic dietary factors (fat, cholesterol) and with overwhelmingly sympatho-stimulatory prolonged socioeconomic and emotional stresses, factors which are also often prevalent in physically active persons Smoking habits do not affect the resting autonomic nervous state of the heart in between the temporarily sympatho-stimulatory individual acts of cigarette smoking Systematic physical training under proper supervision is to be encouraged even in the aging, since it is capable of removing at least one of the presumably major contributory elements in the pathogenesis of functional and degenerative heart disease

Hepatic Allergy to Chlorpromazine—Chlorpromazine was administered daily for at least one month to 68 patients who were hospitalized for neuropsychiatric illnesses at the Veterans Administration Hospital, Brockton, Mass Dosages ranged from 75 to 1,200 mg daily Of 50 patients who had completely normal results from liver function tests before chlorpromazine therapy was instituted, asymptomatic hepatic dysfunction developed in 31 Between initial internal contact with chlorpromazine and onset of hepatic dysfunction there was a latent period varying from 4 to 27 days Of 17 additional patients who had been given chlorpromazine daily for from 3 to 29 days, and in whom the administration of the drug was discontinued promptly on the discovery of hepatic dysfunction, 13 had completely or almost completely recovered from hepatic dysfunction, in these patients acute hepatic dysfunction recurred within 24 to 48 hours after re-exposure to this drug In the development of hepatic dysfunction due to chlorpromazine, though the presence of circulating antibody could not be demonstrated by skin tests, the following criteria for an allergic reaction are considered to be fulfilled immunizing event, latent period, accelerated reaction on re-exposure to a small challenging dose, specificity, and deliberate desensitization The onset of this hepatic disorder is characterized by hepatocellular derangement, manifested by increased sulfobromophthalein sodium retention and serum transaminase level Large doses of synthetic adrenocortical hormone, therapeutically administered after diagnosis of jaundice was established, failed to alter the natural course of the disorder Large doses of the hormone, prophylactically administered, partially inhibited hepatic response to a small dose of chlorpromazine Deliberate hepatic desensitization to chlorpromazine was successfully achieved in 10 patients Large daily doses were continued up to 3 years without adverse effect on the liver A method of deliberate desensitization has been described

Dilatation of the Colon—The authors report on 16 patients with ulcerative colitis who were admitted to the Mount Sinai Hospital, New York, and in whom a rapidly developing and striking dilatation of the colon was associated with extreme toxicity In 13 of the 16 patients the dilatation complicated an acute exacerbation of the disease All patients were febrile, toxic, and dehydrated Most had tachycardia, anemia, and moderate to severe depression A simple abdominal roentgenogram was usually diagnostic and revealed marked colonic dilatation, most pronounced in the transverse colon and sparing the rectum Deep, undermining ulcers were seen by air contrast Pathologically, involvement of all elements of the colon with inflammatory changes was striking Perforation was observed in 4 patients There were 3 deaths, a mortality of 19% Nine patients required emergency surgical intervention Six were treated by ileostomy and subtotal colectomy, with 1 operative death, and 3 prolonged, stormy courses Three patients were treated with decompressing cecostomy, all with resulting improvement The authors emphasize that the results of this approach were so favorable as to demand further trial in these specific circumstances Twelve patients were treated with ACTH or adrenal steroids coincident with the colonic distention, and in some of them the beneficial or detrimental results were clearly evident Recommendations for future management include the administration of ACTH and adrenal corticoids, long tube intubation, and decompressing cecostomy

British Journal of Surgery, Bristol

47 585-707 (May) 1960 Partial Index

°Sensory Nerve Endings and Sensation in the Anal Region H L Duthie and F W Gairns p 585

Radiation in Management of Keloids and Hypertrophic Scars—H A S Van den Brenk and C C J Minty p 595

*Management of Carotid Body Tumors
G Westbury p 605
Intervertebral Disk Protrusions in Childhood and Adolescence—J E A O'Connell p 611
*Extended Right Hemicolectomy in Carcinoma of Hepatic Flexure—H W Gallagher p 616
Adenocarcinoma of the Appendix
G H Cook and B P Flannery p 621
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C G Clark and R N Curnow p 624
Antecubital Strings—A New Physical Sign?
H H G Eastcott p 629
Ureteric Reflux in the Paraplegic
J Cosbie Ross M Damanski and N Gibbon p 636
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P T Savage p 643
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J R Tighe p 658
Common Bile Duct Suture Without Intraductal Drainage After Choledochotomy—P G Collins and others p 661

Nerve Endings and Sensation in the Anal Region—The authors describe investigations on the nerves and nerve endings of the perianal skin in the epithelium of the anal canal and in the mucous membrane of the rectum Material was obtained at operation or at autopsy from 10 subjects The tissues were removed as continuous strips from perianal skin through the epithelium of the anal canal and on to the mucosa of the rectum, they were put through the silver impregnation processes while still in continuity The perianal skin contains only peritrichal endings and free intra-epithelial endings, at the anal margin however, organized nerve endings are found in close apposition to hair follicles The wall of the anal canal has a profuse innervation, especially in the region of the anal valves This innervation has both free intraepithelial endings and organized endings The histological technique, so successful in the perianal skin and in the wall of the anal canal, failed to show endings in the mucosa of the rectum, except in one instance Sensation was tested in 15 normal subjects The epithelium of the anal canal was exquisitely sensitive to pain, to heat, and to cold Touch was delicate, and movement of an object in contact with the epithelium of the anal canal was at once appreciated The profuse sensory innervation of the anal canal probably has a part to play in maintaining the reflexes which ensure evacuation of the distal colon and rectum The fact that pain can be felt up to 1 5 cm craniad to the anal valves emphasizes the importance of making any injection for hemorrhoids at or above the anorectal ring both for efficacy and to avoid producing pain

Management of Carotid Body Tumors—Management of carotid body tumors is discussed on the basis of 7 histologically verified cases seen at the Westminster Hospital London, since 1951 In none of the patients was a correct diagnosis made by the referring surgeon Tuberculosis of lymph nodes, metastatic carcinoma, and branchial cyst were considered. In 4 instances the nature of the tumor was suspected from the naked eye appearances at exploration, but in 3 cases it was realized only after examination of the sections An aggressive rather than conservative attitude towards treatment is warranted Clinical diagnosis may be confirmed by arteriography if doubt remains, proof should be obtained by open biopsy before embarking on an operation likely to damage the carotid trunk Operation should be carried out under hypothermia, and facilities for arterial pressure recording and for vessel grafting should be available Treatment of choice is complete removal with preservation of the common and internal carotid arteries Where the tumor is inseparable from these vessels resection of the carotid bifurcation with restoration of arterial continuity usually by graft, is advisable When grafting is impossible the bifurcation should be sacrificed only if the internal carotid pressure falls less than 60% after occlusion of the common and external carotid arteries, the patient should then be nursed flat or head down for at least 1 week postoperatively The dangers of anticoagulant therapy outweigh any possible benefit Other methods to assess preoperatively the safety of carotid interruption are unreliable, as are those purported to increase cerebral collateral flow Irradiation, preferably by supervoltage, may be of palliative value for inoperable or metastasizing tumors

Extended Right Hemicolectomy in Carcinoma of Hepatic Flexure—The author reviews observations on 8 cases of carcinoma of the hepatic flexure which were treated at Bainbridge Hospital in the last 12 years (about 6% of all cases of carcinoma of the colon treated in this period) In only 2 cases was the duodenum not involved, in 1 of these the growth was confined to the colon and was suitable for standard right hemicolectomy This patient remains well after 18 months In 2 others right hemicolectomy was performed with difficulty because of fixation to duodenum and pancreas, adherent duodenal muscle wall was excised in one who had a local recurrence after 3 years The other patient had local recurrence within a few months In 2 patients the growth was too advanced even for extended right hemicolectomy, palliative ileotransverse colostomy was performed In 1 of the 2 remaining patients the growth had caused a duodenocolic fistula These 2 patients were subjected to an extended right hemicolectomy, which is a combination of right hemicolectomy and pancreatoduodenectomy The high incidence of infiltration of the duodenum and head of the pancreas suggests that extended right hemicolectomy should become a standard operation to be used frequently in the treatment of advanced carcinoma of the hepatic flexure and also in carcinoma of the head of pancreas when the colon is invaded Duodenocolic fistula is one variety of the extension of carcinoma of the hepatic flexure A procedure for palliation is suggested

British Medical Journal, London

2 247-326 (July 23) 1960 Partial Index

Hiatus Hernia
N R Barrett p 247
On Virus Metabolism and Neoplasia
D S Nelson and P M de Burgh p 252
*Right Hemihepatectomy for Primary Hepatoma
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Prevention of Postoperative Edema
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Stress Incontinence of Urine
C Kennedy p 263

Right Hemihepatectomy for Primary Hepatoma—The authors report on a 13-year-old girl with a primary hepatic neoplasm (hematoma), who was admitted to St George's Hospital, London, for removal of the tumor The patient had ascites and anemia, and liver and spleen were increased in size The portal splenogram showed normal splenic and portal vein filling and normal filling of the left lobe of a greatly enlarged liver On the right side, vessels were absent and neighboring portal radicles were displaced medially The value of portal splenography in the diagnosis of hepatic tumors is stressed and evidence is presented to suggest that consideration of the electrophoretic pattern (which may show an increase of alpha- and beta-globulins in each case) may be of value Microscopic appearance of the surgical specimen was that of a malignant hepatoma The biochemical changes resulting from removal of the right lobe of the liver in this patient consisted of a marked rise in the serum alkaline phosphatase and transaminase levels, accompanied by a slow rise in the serum cholesterol level and in the level of its esterified fraction The significance of these changes is discussed The patient's general physical condition was considerably improved and she was about to return to school 6 months after the operation

J Clinical Investigation, New Haven, Conn

39 1043-1200 (July) 1960 Partial Index

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Effect of Changes in Posture and of Graded Exercise on Stroke Volume in Man—Y Wang and others p 1051
Renal Concentrating Mechanisms in Newborn Infants C M Edelmann Jr, H L Barnett and V Troupkou p 1062
Immunochemical Assay of Total Extractable Insulin in Man G M Grodsky and P H Forsham p 1070
Ventilation-Perfusion Relationships in Lungs of Subjects with Chronic Pulmonary Emphysema—H P Gurtner and others p 1080
Aldosterone Secretion and Primary and Malignant Hypertension J H Laragh and others p 1091
*Effect of Estrogens upon Peripheral Metabolism of Thyroxine J Dowling N Freinkel and S H Ingbar p 1119
Destruction of Red Cells by Antibodies in Man J H Jandl and M E Kaplan p 1145
Immuno-assay of Endogenous Plasma Insulin in Man R S Yalow and S A Berson p 1157

Estrogens and Peripheral Metabolism of Thyroxine—In plasma, thyroxine is avidly bound to specific proteins present in low concentration, particularly the so-called thyroxine-binding globulin (TBG) and thyroxine-binding pre-albumin (TBPA) Observations indicate that such protein-hormone interactions are of physiological importance Abnormal thyroxine-binding by TBG and TBPA has been observed in a variety of states in which the peripheral metabolism of thyroid hormone is disturbed It therefore seemed possible that interactions with plasma proteins might in part regulate the peripheral utilization and degradation of thyroxine The studies described concern the effects of estrogens and of the increase in thyroxine-binding by TBG which they induce on the peripheral metabolism of thyroxine in patients with intact thyroidal function, treated myxedema, or toxic diffuse goiter (Graves' disease) In all subjects, estrogen induced an increase in the binding avidity of TBG, which was accompanied by marked retardation of the fractional rate of peripheral turnover of I^{131}-labeled thyroxine In eumetabolic subjects, concentration of protein-bound iodine (PBI) increased sufficiently to restore the daily disposal of hormonal iodine to normal values Two of 4 thyrotoxic patients failed to demonstrate expected increases in the concentration of PBI, and exhibited amelioration of symptoms and of hypermetabolism during administration of estrogen During this period, daily hormonal disposal rates approached values found subsequently during restoration of eumetabolism by propylthiouracil These observations fit the hypothesis that thyroxine-binding by TBG exerts a rate-limiting effect upon the peripheral metabolism of this hormone

Journal of Pathology and Bacteriology, Edinburgh

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Studies on Nature of Collagen Degeneration G Loewi, L E Glynn and J Dorling p 1
Cerebral Lesions Due to Emboli After Cardiopulmonary Bypass—W T Smith p 9
Plasma Proteins and Mucoid Substances in Pulmonary Hyaline Membranes—F A Carone and W G Spector p 63
Nature of Breast Secretion in Infancy J A Dossett p 93
Cardiac Aneurysms in Nigeria J H Robertson and J G Jackson p 101
Streptococcal Hemolysins and Ehrlich Ascites Tumor Cells—I Ginsburg and N Grossowicz p 111
Frequency of Differentiation in Oat-Cell Carcinoma of Lung—J B Walter and D M Pryce p 121
Recovery After Restoration of Obstructed Bile-Duct—G R Cameron and L B M Prasad p 137
Adenocarcinoma of Infant's Testis 15 Cases T B Teoh, J K Steward and R A Willis p 147
* 'Benign' Form of Hodgkin s Disease (Paragranuloma) C J E Wright p 157

"Benign" Form of Hodgkin's Disease—The benign variant of Hodgkin's disease was first described by Jackson in 1937, under the term "early Hodgkin's disease," but later (in 1944) he changed this term to Hodgkin's paragranuloma A review of the records at the Department of Pathology of the University of Leeds from 1910 to 1958 revealed 339 cases histologically acceptable as Hodgkin's disease, which were divided in 26 cases of Hodgkin's paragranuloma (24 of which are reviewed here), 296 cases of ordinary Hodgkin's disease and 17 cases of Hodgkin's sarcoma This suggests a 1 10 ratio of Hodgkin's paragranuloma to Hodgkin's disease Half of the 24 patients have been followed up for 10 to 35 years and all but 1 for more than 5 years Recurrence is frequent, but usually local Hodgkin's disease has a broad range of structure from a predominantly lymphocytic form to one which is predominantly of reticulum cell type, and Hodgkin's paragranuloma seems to be a variant at the lymphocytic end Transitional forms between Hodgkin's paragranuloma and ordinary Hodgkin's disease, as well as various combinations, or mixed forms, may be seen in a large series The correlation of the initial mode of treatment with recurrence in the 24 cases of Hodgkin's paragranuloma is tabulated After excision alone there was recurrence in every case Local radiation would seem desirable, or wide local excision followed by radiation In most instances local recurrence was treated by radiation and disappeared Only 5 of the 24 patients have died, 4 of them apparently from generalization, annd one from bronchial carcinoma with no evidence of lympoid disease at necropsy Hodgkin's paragranuloma is regarded as a true but rare variant of Hodgkin's disease

J Thor Cardiov Surg, St Louis

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*Complete Replacement of Mitral Valve N S Braunwald and others p 1
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*Tricuspid Atresia G R Cumming and others p 31
Pulmonary Circulation During Cardiac Bypass H Aletras and others p 35
Complication of Ligation of Patent Ductus Arteriosus F H Taylor and others p 43
Graft Implantation of Pulmonary Artery Bifurcation L R Sauvage, A M Rudolph and R E Gross p 56
*Bronchogenic Carcinoma with Pulmonary Tuberculosis R E Campbell and F A Hughes p 98

Complete Replacement of Mitral Valve—The authors report on a 16-year-old girl and a 44-year-old woman with mitral regurgitation who were operated on in the Clinic of Surgery, National Heart Institute, Bethesda, Md, and in whom complete excision and successful replacement of the mitral valve were performed After experimental evaluation in 27 dogs, prosthetic mitral valves were employed in the 2 patients These valves have been designed to simulate the normal valve They are constructed of an open-cell polyurethane foam reinforced with Dacron fabric The leaflets are controlled by artificial chordae tendineae which are brought through the wall of the left ventricle, the length of chordae can be adjusted to provide optimum competency of the valve Postoperatively the younger patient at first reacted promptly, was alert and maintained a normal blood pressure without support but after the first 2 hours oliguria developed she suddenly became hypotensive and died 60 hours after the operation Autopsy revealed that the valve was in good position but that in placement of the artificial chordae, one had inadvertently been passed behind the other resulting in obstruction to the valve opening The second patient made a slow but uneventful recovery and was apparently well 6 weeks after the operation The details of the design, fabrication of the valve and the technique of insertion are presented

Tricuspid Atresia —The authors report on a 7-week-old baby girl with tricuspid atresia who was admitted to the Childrens Hospital in Winnipeg, Manitoba, Canada She had severe cyanosis which persisted despite oxygen therapy and administration of digitalis An angiocardiogram showed the atresia of the tricuspid valve and a small patent foramen ovale The patient was operated on according to Glenn s technique the right pulmonary artery was anastomosed to the superior vena cava and the junction of the latter to the right atrium was occluded An immediate postoperative improvement in the cyanosis was noted and the patient was discharged 12 days after the operation When seen 14 weeks later the infant was continuing to do well The anastomosis of the superior vena cava to the right pulmonary artery has had extensive laboratory application it is physiologically a good operation which may be used to bypass the heart in patients with tricuspid atresia The operation increases pulmonary blood flow without increasing left ventricular work Technically it is simple The application of the procedure in this patient was successful Since submitting the paper for publication the authors have operated on 3 additional patients with tricuspid atresia two of these, 5 and 10 months of age, did well, in the 3rd it was not possible to perform a successful anastomosis and this patient died 8 hours after the surgical intervention

Bronchogenic Carcinoma with Pulmonary Tuberculosis — Among 11,000 patients with pulmonary tuberculosis and 650 patients with bronchogenic carcinoma who were seen at the Kennedy Veterans Administration Hospital, Memphis, Tenn , between 1947 and 1958, the 2 diseases coexisted in 24 men 31 to 68 years of age Bronchogenic carcinoma and tuberculosis occurred in the same lung in 19 patients, and in the same lobe in 16 (66%) The carcinoma developed in a site other than that involved by tuberculosis in 8 patients In 5 of these patients the tuberculosis had been considered inactive for from 2 to 16 years, in 3 patients tuberculosis was considered active The reported data indicate that this combination of diseases occurs 20 times more frequently in the patient with tuberculosis than in the patient from the general population The study suggests that this incidence may increase as the age of the tuberculous patient advances All men over 45 years of age with tuberculosis should be studied frequently by clinical and radiologic examinations in the quest for location of malignant lesion in addition to infection Some of the following clinical and radiologic findings should make one suspicious of a possible coexistent neoplasm in patients with tuberculosis (1) no improvement of the patient s general and radiologic status after a reasonable trial of antituberculous chemotherapy, (2) enlargement of the hilar area especially if unilateral, (3) atelectasis of a lobe or segment of the lung, (4) solitary, nodular density, especially if it is in the lower lobes and has a fuzzy border, and (5) cavities with a thick, irregular wall and a poorly visualized eccentrically placed radiolucent central area Any suspicion should then invoke a complete investigation to prove the existence or nonexistence of the 2 lesions

Quarterly Journal of Medicine, London

29 153 312 (April) 1960

*Changes in Fundus Oculi After Hemorrhage
M A Pears and G W Pickering p 153
*Macroglobulinemia Clinical and Pathological Study
N H Martin p 179
Pathogenesis of Hemolysis in Hereditary Spherocytosis
T A J Prankerd p 199
*Aortic Stenosis
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*Nephrotic Syndrome Renal Biopsy and Response to
Steroid Therapy—J D Blainey and others p 235
*Ulcerative Colitis in Childhood
J W Platt B E Schlesinger and P F Benson p 257
*Syndrome of Sporadic Goiter and Congenital Deafness
G R Fraser M E Morgans and W R Trotter p 279
Pathology of Thyroid in Syndrome of Sporadic Goiter and
Congenital Deafness—J F Smith p 297
Studies in Achalasia of the Cardia
F G Ellis and others p 305

Changes in Fundus Oculi After Hemorrhage —Two kinds of retinal lesions after hemorrhage are discussed One patient is described in whom after massive bleeding from the gastrointestinal tract, permanent blindness developed in one eye succeeded by papilledema and then by optic atrophy From a review of previous reports of this type of incident it is apparent that loss of blood from any source may result in blindness either immediately or after several days When loss of vision is delayed the primary lesion may occur not in the retina itself but in the optic nerve behind the lamina cribrosa Papilledema, hemorrhage and exudates may develop in the fundus oculi of patients who have recently sustained massive hemorrhage The retinas of such patients may closely resemble those found in the malignant phase of hypertension though the lesions tend to be less widespread and severe Eight such cases are described in 4 of which observations were made on the relationship between hemoglobin and blood pressure levels and the development of retinopathy These observations cast doubt on the supposition that anemia is always the cause of the retinal lesions and suggest that in some cases the retinal changes may occur as a consequence of profound, though transient, reduction in blood pressure A puzzling feature of this relationship is the interval between the circulatory changes and those in the retina The similarity between the retinal lesions seen in the malignant phase of hypertension and those which occur after gastrointestinal hemorrhage suggests that they may have a common pathogenesis This is most probably focal anoxia of the retina though how this is produced is not clear

Macroglobulinemia Clinical and Pathological Study —In 1944, Waldenstrom described 2 patients whose serum was unusually viscid at room temperature and contained large amounts of gamma globulin having a sedimentation coefficient of between 19 and 20 Svedberg units, compared with a normal value of about 7 Because of these findings, and the presumably high molecular weight, Waldenstrom proposed the name "macroglobulinemia" to differentiate the condition from myelomatosis This paper is based on material collected from 18 patients, only three of whom were less than 50 years old, the majority were over 60 years of age Weakness, lassitude and shortness of breath were frequent complaints, but these might largely be explained by the age of the patients An increasing "mistiness" of vision is regarded as a more remarkable feature Examination of the fundi in the patients who had this complaint showed distended and tortuous retinal veins, with scattered hemorrhages With the exception of these visual symptoms and retinal changes the clinical picture was not distinctive Three findings were common in the peripheral blood a moderate to severe anemia (usually orthochromic and normocytic in pattern), an increased erythrocyte sedimentation rate, and a normal leukocyte count with a relative lymphocytosis The serums contained excessive amounts of globulins having a sedimentation coefficient greater than 17 The diversity of histopathological findings associated with gross macroglobulinemia makes it questionable whether there is any justification for continuing to regard macroglobulinemia as a specific disease

Aortic Stenosis—Percutaneous left ventricular puncture, which was developed for a more critical pre-operative assessment of mitral stenosis, has improved understanding of the clinical and hemodynamic features The results of percutaneous left ventricular puncture in 70 patients with aortic stenosis are presented and correlated with various clinical features An aortic valve area of from 10 to 35% of the normal size of the orifice represents a significant degree of aortic stenosis In such patients the raised left ventricular systolic pressure ranges up to 300 mm Hg at rest, and the mean systolic pressure gradient across the aortic valve ranges from 25 to 130 mm Hg Cardiac output in severe cases is generally normal or raised, and the left ventricular external work ranges up to 6 times the normal In advanced left ventricular failure the cardiac output falls, but the systolic pressure and work of the left ventricle remain raised In patients under 35 years of age clinical symptoms of left ventricular failure are rare, although hemodynamic evidence is common T-wave inversion in the left precordial leads is nearly always present in patients with moderate or severe aortic stenosis, excepting children Mild stenosis is best detected by the electrocardiogram, although generally there are atypical physical signs as well An anacrotic, slowly rising arterial pulse contour is present in the majority of moderate and severe cases The anacrotic notch results from the high-velocity jet effect in the aorta The prolonged upstroke time is related to the prolonged ejection period of the left ventricle A normal arterial pulse contour in a patient with aortic stenosis may indicate that the stenosis is mild, that it is subvalvar, or that there is subvalvar muscular obstruction associated with severe valvar stenosis

Nephrotic Syndrome Response to Steroid Therapy—A study of the nephrotic syndrome, mainly in adults and young adults, has been carried out during the last 8 years at the University of Birmingham Medical School Of 200 patients with proteinuria, 80 had the nephrotic syndrome For the last 3 years investigations have included 33 renal biopsies in 29 patients In 21 patients glomerulonephritis was diagnosed These patients could be subdivided into 4 groups membranous, proliferative, and chronic glomerulonephritis, and a group showing minimal histological change Response to prolonged cortisone therapy was correlated with the histological lesion Patients with minimal changes recovered rapidly, those with proliferative changes responded more slowly (4 out of 6 patients), while no patient with membranous lesions showed any response One patient with chronic nephritis improved The effect of treatment on the histological lesions has been examined in only 4 patients In 2 with proliferative changes there was a striking absence of fibrosis in the later specimen, a glomerular lesion remained, though considerably modified One patient progressed from minimal to membranous change while under treatment, autopsy revealed renal vein thrombosis Possible diagnostic differences between the 4 groups were looked for by scrutinizing clinical and biochemical data A new technique for quantitative immunological analysis of serum and urinary proteins showed functional changes correlating with histological lesions Most of the cases could have been diagnosed clinically as "type 2' nephritis, the serious prognosis attributed to this condition, however, was evident only in the 20% of the patients who showed membranous changes on biopsy In the remaining 80%, evidence suggested that continuous cortisone therapy has been effective in producing clinical and biochemical remission

Ulcerative Colitis in Childhood—In 53 cases of ulcerative colitis in children, diagnosis was established by characteristic findings on sigmoidoscopy, in another 9, clinical considerations left little doubt The commonest age at onset was 8 years, but 7 cases began in the first year of life Blood in the stools was frequently the initial symptom, early morning diarrhea was often marked, tenesmus occurred in 33 cases, and abdominal pain in 35 Onset of the disease was insidious in 45 cases and abrupt in 17 The series included 2 brothers, and a brother and sister, in 5 other families there was a history of ulcerative colitis in close relatives One-fifth of the children were Jewish Psychological disturbance in the family was apparent in less than half the cases There was only one case with an acute, fulminating, and fatal course, but arthritis occurred in 17% Most children were given high-protein low-residue diets Steroids often produced a rise in hemoglobin levels when iron failed, but even with the use of steroids, iron therapy and transfusion remained valuable Chalk and opium mixtures, hog s stomach, and desiccated ileum were used orally Retention enemas were also tried Steroid therapy was employed in 21 cases with no improvement in 3, probably because of too small a dosage Of 12 surgically treated patients, 9 had undergone ileo-rectal or ileo-colic anastomosis in single or multiple stages Five of 6 had no serious trouble at the time this paper was written, the 6th had a fecal fistula, and 3 patients were greatly improved Two patients had died of carcinoma in their 3rd decade Of 5 other deaths, 4 might have been averted by surgery Long-term follow-up showed that 60% of the patients were well

Sporadic Goiter and Congenital Deafness—The authors point out that Brain, in 1927, described 12 members of 5 families, all deaf from birth and with goiters dating from middle childhood In these families there were no cases of goiter alone, or of congenital deafness alone, both conditions were regarded as independent manifestations of the same recessive-gene defect Morgans and Trotter, in 1958, observed that labelled iodine could be partially discharged from the thyroid by the administration of potassium perchlorate The object of the present investigation was to see whether other subjects with the goiter-deafness syndrome reacted to perchlorate in this way Eighteen families were available for study there were 28 subjects with both goiter and congenital deafness Affected and unaffected members of these families were studied by the administration of potassium perchlorate 1 hour after an oral dose of radio-iodine In all the congenitally deaf subjects the radio iodine in the thyroid was partly discharged by perchlorate Audiograms showed severe high-tone deafness in all the subjects who reacted in this way to perchlorate Genetic studies showed that the goiter deafness syndrome is inherited as a simple recessive The main feature of the thyroid abnormality is inability to form organic iodine compounds at a normal rate The gland is enlarged, and the subjects may be hypothyroid, but are more commonly euthyroid The deafness is perceptive in type and accompanied in some cases by defective vestibular function It is not caused by hypothyroidism but is an independent expression of the same gene defect

Surgery, St Louis

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Transposition of the Great Vessels—The authors reviewed observations in 72 patients with transposition of the great vessels Fifty-four of the patients died, operations were performed on 32 The patients were divided into 4 groups The 18 patients of Group 1 had transposition of the great vessels with patent foramen ovale The 32 patients of Group 2 had transposition with ventricular septal defect The 16 patients of Group 3 had transposition with pulmonary stenosis and ventricular septal defects The 6 patients of Group 4 had transposition with complex associated deformities The palliative procedure suggested for the various groups is to help the patient to survive beyond infancy so as to permit definitive correction at a later time The 2 major problems limiting survival in patients with transposition of the great vessels were (1) inadequate mixing of the pulmonary and systemic circulations, and (2) pulmonary congestion A patent ductus arteriosus may contribute to pulmonary congestion and, except in those with pulmonary stenosis it seems logical that this structure be interrupted at the time other palliative procedures are performed Complete surgical correction will probably be possible only in Group 1 patients and in those of Group 2 who do not have a single ventricle and who with the aid of palliative procedures can be made to survive beyond infancy Three types of procedure were used in an attempt at total correction of transposition (1) retransposition of the aortic and pulmonary artery roots, (2) transposition of the systemic and pulmonary veins (partial transposition has had temporary success), and (3) transposition of the atrial septum with or without the use of a prosthesis

Surgery in Pulmonary Stenosis Extracorporeal Circulation—The authors review their experience in the treatment of 55 patients with the preoperative diagnosis of pulmonic stenosis They became impressed by the fact that catheter and even angiographic evidence does not always establish the extent of existing malformations Fifty-three of the patients came to operation with a diagnosis of valvular stenosis and 2 with infundibular stenosis Some also had atrial and interventricular septal defects The management of these 55 patients reflects the evolution of surgical treatment First, closed transventricular valvotomy by the method described by Brock was used, then open transarterial valvotomy as advocated by Swan Since 1957, all 29 elective operations for pulmonary stenosis have been performed with the use of extracorporeal circulation Secondary infundibular stenosis was found to be present in more than one-half of the cases repaired electively, and was responsible for 2 postoperative deaths and 5 reoperations Direct vision of the infundibulum is the only reliable method of evaluating the extent of secondary stenosis, for this reason the authors have made increasing use of a transventricular approach in cases diagnosed as pure valvular stenosis Since adoption of this policy there has been no death in 16 cases and morbidity has been reduced In the young child with severe right ventricular hypertension frequently with cyanosis, and often with established right ventricular failure, the situation is critical A swift valvotomy can be lifesaving, but there is high operative risk Emergency pulmonary valvotomy can be curative, but the authors believe that valvotomy performed on an infant may require further enlargement later in life

Repair of Ventricular Septal Defect Through Right Atrium—Ventricular septal defect with a predominant left-to-right shunt is usually considered an indication for surgical repair The degree of pulmonary hypertension is the most important prognostic factor, with low to moderate pressure the mortality was 2%, but with pulmonary artery pressures of 70% or more of systemic arterial pressure the mortality was 50% The authors reasoned that with the high pulmonary vascular resistance, the right ventricle with a long incision was not able to propel blood through the lungs adequately Right-sided heart failure ensued, followed by death If the ventricular septal defect could be closed without a right ventriculotomy, the chances of survival might be greater The 2 most logical approaches appeared to be repair of the ventricular septal defect through the right atrium or through the left ventricle The authors considered the right atrial approach the most advantageous for closure of high pressure ventricular septal defects it was used in 7 patients without a single death These patients were given digitalis before and after operation, and intermittent positive pressure breathing was employed Whenever indicated, tracheotomy and constant positive pressure breathing were employed All 7 patients have done well In an 8th patient with corrected transposition of the great vessels and pulmonary artery pressure of 60% of systemic pressure, this approach was used, the patient died because of technical difficulties, the tricuspid valve had caused pulmonary artery obstruction necessitating a prolonged perfusion This approach is probably contraindicated in patients with corrected transposition of the great vessels

Flow Alterations in Cerebral Arterial Insufficiency —Arteriographic studies on 425 patients with clinical signs of cerebral arterial insufficiency showed that lesions producing varying degrees of occlusion were present extracranially in about 40% of the cases Endarterectomy and bypass graft procedures restored circulation, but problems arose with this therapy Blood pressure changes in the region of disease before, during, and after operation, carotid sinus activity, and cerebrospinal fluid pressure changes were studied to estimate the functional significance of a lesion Occlusive lesions producing less than 47% reduction in lumen diameter did not produce a blood pressure gradient Vague symptoms were not relieved by removal of these lesions but were considered functionally insignificant Lesions producing more than 50% reduction in lumen diameter were, however, associated with blood pressure gradients, with clinical manifestations, and with physical manifestations of alterations in blood flow and so they were regarded as functionally significant Mean intra-arterial blood pressure distal to temporary occlusion in patients with occlusion of the internal carotid and vertebral arteries varied from 12 to 90 mm Hg, depending upon the presence of hypertension and contralateral occlusion The lowest pressures were found in patients with complete contralateral occlusion Cerebral deficits occurred in these patients after brief periods of occlusion, indicating the need for support of circulation during operation Pressure was raised by the administration of phenylephrine (Neo-Synephrine) solution but cerebral dysfunction was not prevented Temporary internal shunts, however, made the pressure distal to the occlusion equal to the proximal pressure and maintained normal cerebral pressure Use of atropine sulfate did not prevent bradycardia and hypotension, but phenylephrine solution given intravenously reversed the hypotension

Renal Revascularization for Hypertension —It is currently accepted that hypertension of renal origin is initiated by an alteration in pulse pressure wave in the renal arteries followed by release of renin Renin acts on a protein substrate from the liver to produce a decapeptide, which in turn is converted to the pressor octapeptide, angiotensin Even in renal hypertension, however, arterial pressure is the composite result of many and interacting physiologic processes The aim in recent techniques has been the restoration of normal renal circulation with renal conservation rather than with nephrectomy In this paper the authors analyze physiologic measurements in 32 patients in whom renal revascularization was performed for unilateral or bilateral renal artery occlusive disease Renal artery bypass with a graft was the method most frequently employed in revascularization In selected cases, direct reconstruction of the narrowed segment of the renal artery was performed with a patch graft Eighty-one per cent of these patients had normal blood pressure after operation Nineteen per cent were improved but had some residual hypertension Renal blood flow studies seemed to corroborate experimental evidence pointing away from renal ischemia as a trigger mechanism in the production of renovascular hypertension In unilateral renal artery stenosis, the kidney distal to the occlusive process becomes the better kidney following revascularization from both a functional and pathologic standpoint Severe hypertension without obvious cause, such as pyelonephritis, warrants renal arteriography, which is the only method for establishing the diagnosis of renovascular hypertension

Portacaval Shunt Operation in Cirrhosis and Ascites —Cure of ascites would seem to be accomplished by reduction of the intrahepatic pressure The use of side-to-side shunt (affording a 2nd outflow tract) has been proposed for treatment of ascites An end-to-side shunt, while probably reducing the volume flow of blood through the liver in those patients who formerly had a cephalad flow through the portal vein, could, however, actually increase the congestion by removing the accessory outflow route in patients who had had retrograde portal flow preoperatively Thus, one is tempted to condemn the end-to-side shunt Several authors have recently advocated the use of side-to-side shunts for the treatment of ascites The authors subjected 15 patients with cirrhosis of the liver and "medically irreversible" ascites to portacaval shunting Thirteen underwent end-to-side portal vein to vena cava shunts, one side-to-side shunt, and one a splenorenal shunt All were studied for at least one month before operation and for as long as they remained in hospital after operation Balance studies were made, the daily urinary output of sodium being stressed in this report These patients constituted a high-risk series from the standpoint of liver function, 4 did not live beyond 60 days Failure to cure ascites was observed in 2 patients, including the one in whom a side-to-side shunt had been performed All 9 patients in whom the ascites was cured had undergone end-to-side shunts Five of these are still living 4 to 6 years after the operation The authors conclude that end-to-side portacaval shunting cures ascites in patients with cirrhosis of the liver

Long Esophagomyotomy for Diffuse Spasm and Hypertensive Sphincter —Indications for the use of esophagomyotomy (the modified Heller procedure) in the treatment of achalasia of the esophagus have been extended Findings have suggested that certain disorders characterized by hyperactivity of the esophagus and its sphincter might be benefited by a more extensive esophagomyotomy than that originally proposed by Heller for the treatment of esophageal achalasia The authors have employed an extended esophagomyotomy in 20 patients with functional disorders other than achalasia Fourteen of these patients had diffuse spasm of the esophagus, 4 had diffuse spasm and a hypertensive gastroesophageal sphincter, and the remaining 2 patients had only a hypertensive sphincter Pain and dysphagia were the predominant symptoms, with pain being the more pronounced and dysphagia occurring intermittently or not at all There were no deaths or complications after operations, which involved a long myotomy of the distal portion of the esophagus (8 to 15 cm in length) and repair of an associated sliding esophageal hiatal hernia in some cases Follow-up data for periods ranging from 6 to 35 months were available in 19 of the 20 patients The operation produced improvement in 16 of the 19 patients, 8 of these patients had excellent results, 7 had good results, and 1 had fair results The results were poor for 3 patients, all of whom had diffuse spasm of the esophagus alone Studies of esophageal motility carried out before and after operation not only helped to define the limits of the disease and, consequently, the area to be attacked by operation, but also provided objective evidence of the effectiveness of the operative procedure

WASHINGTON NEWS

Government Medical Expenditures
FDA Investigations
Antibiotic Drugs
Hospital Ship Hope
Miscellany

GOVERNMENT MEDICAL EXPENDITURES RISE

On the basis of funds appropriated by Congress, it is estimated that federal spending in the medical field will exceed $3 7 billion in the current fiscal year

This is about $500 million more than in the last fiscal year and continues a trend of rising federal expenditures on medical programs in recent years The total of $3 2 billion in fiscal 1960, which ended last June 30, was $216 million more than in the preceding year

The bulk of the total in fiscal 1961 was allotted to three agencies Department of Health, Education, and Welfare $1 6 billion, Veterans Administration $1 billion, and the Defense Department $800 million

The major share of the HEW's $300 million increase went to the National Institutes of Health which was voted $560 million, as against $400 million in fiscal 1960

The bulk of the NIH funds goes to private institutions and individuals in the form of grants for research

The National Cancer Institute received $111 million for fiscal 1961, a $20 million increase The Mental Health Institute appropriation was jumped from $68 million to $101 million The NIH fund for general research and services was increased from $46 million to $84 million

The same amount as in the previous year, $150 million, was voted for the Hill-Burton hospital construction program The VA total, which was $67 million more than the previous year, included $766 4 million for inpatient care at VA hospitals $86 5 million for outpatient care, $70 4 million for construction and modernization of hospitals, $35 3 for domiciliary care, $22 5 for medical research, and $15 2 for contract hospitalization

FDA EMPLOYEES CLEARED

A special outside investigating committee cleared FDA employees of conflict-of-interest charges

The three-man investigating group was appointed by Arthur S Flemming, Secretary of Health, Education, and Welfare, after it was brought out in drug industry hearings of the Senate Antitrust Subcommittee that Dr Henry A Welch, Director of the FDA's Antibiotics Division, had substantial outside income as a drug expert

Welch received $287,000 over eight years as a writer and editor for antibiotics publications

After examining the financial records of all 900 FDA employees, the special investigators reported

"On the basis of all the evidence before us, it is our judgment that there are no present employees of the FDA whose sources of personal income are incompatible with their government employment"

The investigators are continuing to analyze 'a mass of fact and opinion as to other charges made before the Senate subcommittee It was charged, along with the conflict-of-interest allegations, that there was too close a relationship between some FDA employees and the companies they are charged with regulating

The investigators said they could not complete the analysis for several weeks But they said they expected it would demonstrate "the possibility of organizational or procedural improvements"

The investigators are Charles H Kendall, General Counsel of the Office of Civil and Defense Mobilization, Dr Charles Austin Doan (M D), Dean of the School of Medicine at Ohio State University, and William A Costello, Regional Inspector for the Internal Revenue Service

ARMY TRIPLES SUPPLIES OF ANTIBIOTIC DRUGS

The Army is tripling its supplies of antibiotic drugs in a move designed to strengthen its defenses against possible germ warfare

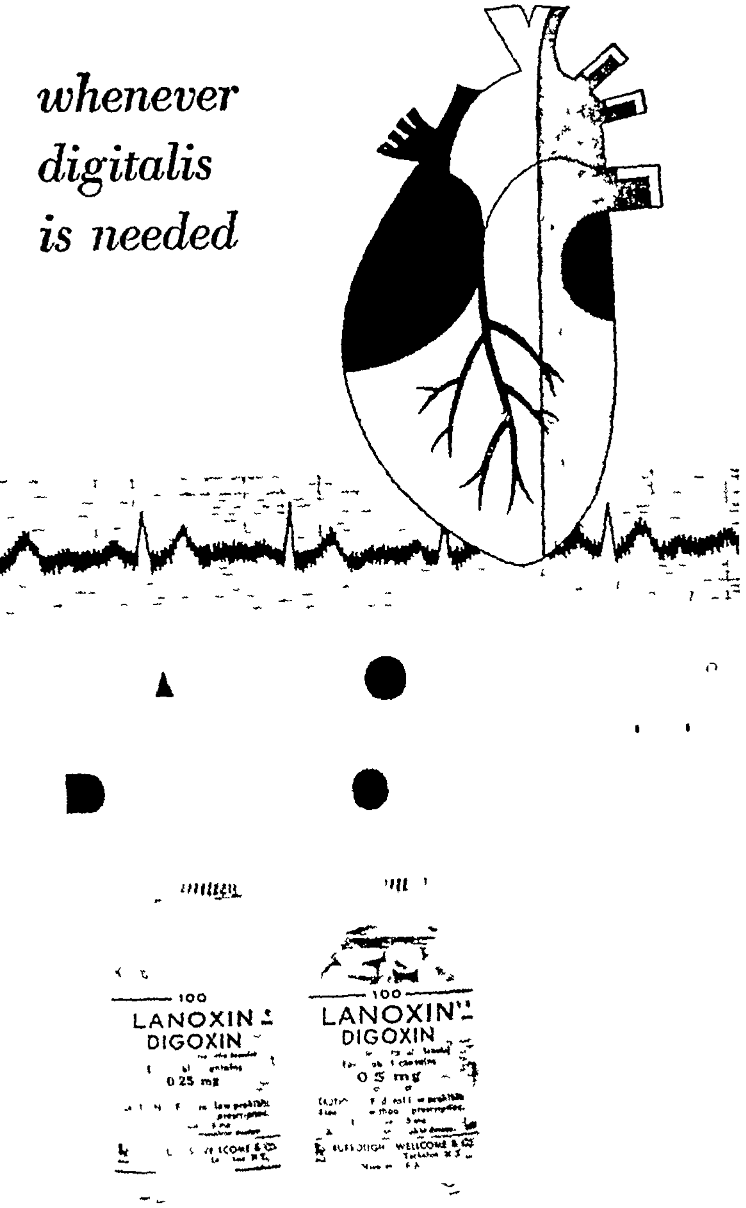
Col W D Tigertt disclosed the action in a report to the 77th Annual Convention of the Association of Military Surgeons of the United States

He also said the Army is experimenting with several promising live vaccines against diseases that might be used in germ warfare They include a Russian-developed vaccine against rabbit fever in humans and a vaccine against Venezuelan equine encephalomyelitis which also can infect man

Col Tigertt said the Army decided to increase its stockpile of antibiotics on the basis of evidence which he said shows that "practically all diseases due to bacteria and rickettsia, as well as to certain of the viruses, can be controlled readily after their

(Continued on next page)

whenever digitalis is needed



“If one digitalis agent were to be recommended for its adaptability to the many and varied clinical contingencies, we believe Digoxin would be [a] drug of choice.”

Lown, B , and Levine, S A ·
Current Concepts in Digitalis Therapy,
Boston, Little, Brown & Company.

onset by the early use of adequate quantities o antibiotics given by the mouth”

As to the possibility of germ warfare, Col Tig said “there is an enemy capability of unknown m nitude to induce illness in varying numbers personnel through exposure to biological agents

Army sources also predicted that the Defer Department will more than double its expenditur on weapons for chemical and biological warfa over the next several years

The stepped-up program will involve both leth and non-lethal weapons which can be delivered b a variety of means ranging from grenades to fas flying aircraft

In the non-lethal category are chemical weapons that could temporarily immobilize enemy troops o populations in enemy cities without permanent damage They could be used to break up riots and attacks and to screen the advances of U S and allied troops They are many times more effective than such riot-control materials as tear gas

Army sources said they expected the budget going to Congress in January to boost research and development outlays for chemical and biological warfare to $76 million compared with $ million this year They said the annual spending rate should reach $200 million in another seve years

HOSPITAL SHIP HOPE WELL RECEIVED

The head of Project HOPE reported that the People-to-People hospital ship is being well received in Indonesia on its maiden goodwill cruise

Dr William B Walsh, Washington, D C, internist and heart specialist who heads Project HOPE, told a news conference in the nation's capital that physicians, government officials, and the people in Indonesia are enthusiastic about the hospital ship which arrived in Djakarta on Oct 19 He was with the ship for the first 2 weeks of its sta in Djakarta

The primary purpose of the project is to teach and to train the doctors, nurses, and medical technicians, of the countries visited, in modern medical techniques and practices It will spend 6 months in various Indonesian ports with a rotating staff of 70 American physicians, nurses, and medical technicians

Four training conferences are being conducted aboard the 15,000-ton World War II hospital ship in the morning and four others in the evening Indonesians are attending them in capacity numbers, as many as 800 a day, Dr Walsh said

Eight or nine operations of varied types ar being performed daily The cases are selected jointly by HOPE and Indonesian physicians on t basis of teaching and training potentialities Indonesian physicians and nurses participate in all o them as students

At the request of Indonesian officials, HOPE officials agreed to set up a teaching and training center as an adjunct of the hospital ship at a n hospital at Djakarta It is being staffed by Americans on a rotating, 4-month tour, basis

Indonesian President Sukarno expressed great enthusiasm about the SS HOPE after inspecting it

MISCELLANY

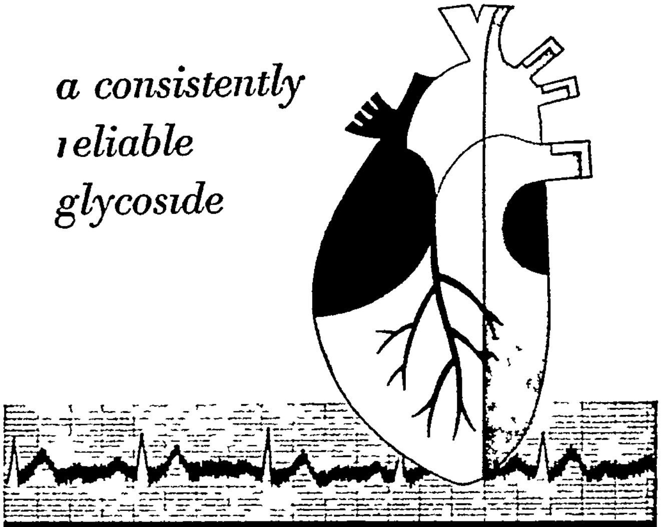
Eleven physicians, prominent in aviation medicine, were named to a new Medical Advisory Council set up by the Federal Aviation Agency to assist its Bureau of Aviation Medicine with plans for developing, operating, and coordinating FAA's medical program The Council also will make possible an exchange of views between the agency and the medical profession at large The physicians accepting one year appointments are Dr William F Ashe, Jr, a professor and Chairman of the Department of Preventive Medicine, and Professor of Internal Medicine at Ohio State University, Dr C I Barron, Medical Director of Lockheed Aircraft Corporation, Burbank, California, Dr Neal Baxter, Medical Director of Westinghouse Corp, Bloomington, Indiana, Dr Robert H Felix, Director of the National Institute of Mental Health, Dr George J Kidera, Medical Director of United Air Lines in Chicago, Dr W Randolph Lovelace, Surgeon and Director of the Lovelace Foundation for Medical Education and Research, Albuquerque, N M, Dr Ross A McFarland, Professor of Environmental Health and Safety, Harvard School of Public Health, Dr Lemuel Clyde McGee, attending Chief of the Department of Medicine, Delaware Hospital, Dr Charles M Starr, recent past President of the Flying Physicians Association, Dr Jan H Tillisch, Consultant in Internal Medicine, Mayo Clinic, Dr Benjamin J Wolpaw, Ophthalmologist, Cleveland, Ohio

As part of a continuing program of study into health related characteristics of the aging process, 94 grants totaling $1 9 million were announced by the National Institutes of Health for research in various aspects of aging

Two physicians with A M A posts discussed doctor-patient relationships at a Washington, D C, forum Dr Leo H Bartemeier, Baltimore, psychiatrist and Chairman of the A M A Council on Mental Health, said physicians should not treat patients whom they dislike but should persuade them to go to another doctor Dr Thomas E Rardin of Columbus, Ohio, a general practitioner and Vice Chairman of the A M A Section on General Practice, urged physicians not to forget that patients, often insecure and frightened, look to the doctor for warmth and guidance

The U S Public Health Service and the American Heart Association have advised that persons with heart, blood vessel, or lung diseases get vaccinations against influenza as a matter of course A joint statement said 'Evidence of the past three years has abundantly confirmed that the dangers of influenza are much greater for patients with heart or lung disease than for others'

Two research physicians of the VA division of geographic epidemiology reported that multiple sclerosis apparently results, perhaps indirectly, from some harmful environmental factor such as cold or lack of sunshine, or from lack of a protective environmental factor, in some areas They reached that conclusion after studying the medical records of 1,782 U S veterans with multiple sclerosis



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Clinical reports indicate

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Medical News

Second National Conference on the Medical Aspects of Sports

The Second National Conference on the Medical Aspects of Sports is to be held on Nov 27 in Washington, D C, immediately preceding the A M A Clinical Meeting in that city Chief purpose of the conference is to provide a forum for discussion of problems relating to the health aspects of athletics It is suggested that interested physicians may wish to combine attendance at the conference and the clinical meeting

Morning panels will include discussions on Protecting the Boxer and "On Field Care of the Football Player,' with Dr Ira A McCown, of New York City, and Dr Owen B Murphy, of Lexington, Ky, leading these sessions The noon luncheon will feature Dr Robert A Moore, of Ann Arbor, Mich, who will talk on "Psychological Factors in Athletic Injuries'

Four significant discussion topics will highlight the afternoon sessions, participants may elect sections dealing with (1) Health Supervision of the High School Athlete, (2) The Future of Boxing as a Sport, (3) The Child in Athletics, and (4) Nutrition of the Athlete Later a symposium on "Special Problems in Sports, covering the 'Biomechanics of Running,' "Women in Athletics, and the Medical-Legal Aspects of Athletics, will conclude the afternoon program

The evening session will be devoted to a report on the Olympic Games with Dr Daniel F Hanley, of Brunswick, Maine, one of the attending physicians at the Games, as the principal speaker Dr Allan J Ryan of Meriden, Conn, is Chairman of A M A's Committee on the Medical Aspects of Sports, which is sponsoring the conference

ALABAMA

First Unit Mass Testing for Emphysema—The nation's first mobile-unit mass testing for pulmonary emphysema has been launched in Birmingham Financed by a $20,000 grant from 24 Alabama counties and the National Tuberculosis Association, the state-wide pilot study will utilize a new electronic testing apparatus that simultaneously records the subject's volume and rate of breathing and measures the amount of air reserve in the lung Developed by Dr Ben V Branscomb, associate professor and director of the pulmonary division, University of Alabama Medical College, the device was made public at the annual meeting of the Alabama Tuberculosis Association

Personal—The reappointment of Dr Robert C Berson to serve on the National Advisory Council on Health Research Facilities was announced Aug 10 by Surgeon General Leroy E Burney of the Public Health Service, Department of Health, Education and Welfare Dr Berson, vice-president and dean of medicine of the University of Alabama Medical Center in Birmingham, was originally appointed to the council in February, 1959, and will now serve through August, 1961

CALIFORNIA

Trudeau Society Award Offered for Pulmonary Paper—The California Trudeau Society invites entries for its 10th annual award of $150 for the best paper on a clinical, laboratory, or epidemiological aspect of any pulmonary disease Manuscripts, published or unpublished, must have been written during the 12 months preceding Jan 1, 1961 Any resident of California is eligible except employees of the California Tuberculosis and Health Association The author of the winning paper will receive $150 and will be invited to attend the 1961 3-day annual meeting of the California Tuberculosis and Health Association in San Francisco, all expenses paid Papers should be sent before Jan 1, 1961, to the Trudeau Society Award Committee, 130 Hayes St, San Francisco 2 A sealed envelope containing the name and address of the author and title of paper should be enclosed The author's name must not appear on the paper itself

CONNECTICUT

Medical Art Exhibit at Yale—Medicine and art joined forces Oct 26 with the opening of an exhibition of a famous collection at the Yale University Art Gallery The exhibition contains a selection from the Clements C Fry Collection of Medical Prints and Drawings and is one of the highlights of the 150th anniversary program of the Yale School of Medicine The collection was a lifelong hobby of the late Dr Clements C Fry, former psychiatrist-in-chief of the Yale University department of university health Dr Fry died in 1955 and bequeathed his extensive collection to Yale One hundred and five items have been selected from more than 1,000 prints and drawings collected by Dr Fry during his lifetime Spanning a period of 4 centuries of Medicine in Art, the exhibit ranges from a 16th century engraving by the German artist Hieronymous Greff to the original wash drawings of contemporary cartoonists, Whitney Darrow Jr and William Steig The exhibit, prepared by Mrs Elizabeth S Gee and Mrs Shirley M Haupt, both on the staff of the art gallery, will be open to the public without charge until Dec 4

Faculty Appointments—The appointment of 3 doctors to the department of pediatrics at the Yale School of Medicine was announced by Dr Milton J E Senn, chairman of the department They are

Dr Louis Gluck, assistant professor of pediatrics, Dr Norman S Talner, assistant professor, and Dr Harrison F Wood, assistant clinical professor Dr Gluck comes to Yale from Stanford where he was instructor in pediatrics He received his M D degree from the University of Chicago in 1952 He was an instructor at Columbia University, 1958-1959, before going to Stanford At Yale he will be in charge of the newborn service Dr Talner will be in charge of the pediatric cardiopulmonary laboratory He received his M D degree in 1949 from the University of Michigan He was on the medical faculty at Michigan from 1954 until his Yale appointment Dr Wood was medical director of Irvington House in New York City from 1955 to 1960 and was also on the faculty of the New York University College of Medicine A graduate of New York University, he served as assistant surgeon with the U S Public Health Service, 1946-1948, and he was on the staff of the Rockefeller Institute from 1948 to 1955

Summer School of Alcohol Studies—The 19th annual session of the Summer School of Alcohol Studies at Yale University will be held June 25-July 20, 1961 Lectures will be given by specialists drawn from the social sciences, medicine and psychiatry, religion, education, and public health There will also be workshops and seminars for public health personnel on the epidemiology of alcoholism, tuberculosis and alcoholism, and community mental health services and alcoholism Enrollment is limited to 300 students For information, write the Registrar, Yale Summer School of Alcohol Studies, 52 Hillhouse Ave, Yale Station New Haven, Conn

DISTRICT OF COLUMBIA

D C General Hospital Alumni Association—The Alumni Association of the District of Columbia General Hospital, Washington, D C is trying to locate and identify former interns, residents, fellows, and medical officers of the institution It is urgently requested that those who have been affiliated with this hospital contact the Membership Committee of the D C General Hospital Alumni Association, Washington 3, D C

ILLINOIS

Chicago

Jelke Memorial Building Dedicated—A significant step toward the 10-year development plan of Presbyterian-St Luke's Hospital was realized on Nov 2 when the hospital's Jelke Memorial Building for medical science and research was dedicated John F Jelke Jr, retired Chicago manufacturer, contributed one million dollars toward the construction of this building, which is named in memory of his parents, John F. Jelke, a pioneer in the oleomargarine business, and Louanna Frazier Jelke Participants in the dedication exercises included Gavin A Pitt, newly elected president of Presbyterian St Luke's, presiding, John P Bent, vice-chairman, board of trustees, who described the new building with slides, Harold J Nutting, chairman of the board, who discussed "long-range planning" showing slides of future building plans, and William M Collins Jr, chairman of the building committee, and Dr Thomas J Coogan, president of the medical staff, both of whom unveiled a large plaque commemorating Mr Jelke's gift Nine floors of the Jelke Memorial Building have been completed and six additional floors containing patient units will be added as soon as the necessary funds become available The third, fourth, fifth, and eighth floors will be occupied by laboratories, the sixth floor houses 8 surgical operating facilities, bringing the hospital's total number of operating rooms to 25 The seventh floor contains surgical observation galleries and staff quarters Mechanical equipment for the building is installed on the ninth floor The first and second floors will become a part of new outpatient facilities when construction on the next phase of the hospital's master plan is completed

Dr Paul H Holinger Honored—Dr Paul H Holinger, attending broncho-esophagologist at Presbyterian-St Luke's and Children's Memorial hospitals, and professor of broncho-esophagology, University of Illinois, became the third United States physician to be invited to give 'The Semon Lecture," presented annually at the University of London, England "The Semon Lecture' was founded in 1911 in honor of Sir Felix Semon, an internationally known otolaryngologist of the University of London The lecturer's appointment is made by a joint committee of the University of London and the Royal Society of Medicine Dr Holinger's lecture, on clinical problems associated with congenital anomalies of the larynx, tracheobronchial tree, and esophagus, preceded the meeting of the laryngological section of the Royal Society of Medicine at the University of London on Nov 3 Since 1911, practically all countries throughout Europe and the Americas have been represented in the selection of lecturers The two United States laryngologists previously invited were Dr Harris P Mosher, of Boston, in 1929, and Dr Arthur W Proetz, of St Louis, in 1952

Faculty Appointments—Dr Donald J Ferguson, formerly director of the VA Hospital and professor of surgery, University of Minnesota, Minneapolis, was appointed professor of surgery at the University of Chicago on Oct 1 Dr George E Block, formerly of the University of Michigan, Ann Arbor, became assistant professor of surgery at the University of Chicago on Nov 1

INDIANA

State Medical Election—The following officers were elected at a recent meeting of the Indiana State Medical Association president, Dr Guy A Owsley, Hartford City, president-elect, Dr Harry R Stimson, Gary, treasurer, Dr Irvin W Wilkens, Indianapolis, assistant treasurer, Dr Charles F Gillespie, Indianapolis, chairman of council, Dr Maurice E Glock, Fort Wayne, chairman of executive committee, Dr Donald E Wood, Indianapolis

MARYLAND

Award for New Clinical Research Center—The University of Maryland has been notified of the award of $601,686 from the National Institutes of Health for the establishment of a clinical research center at University Hospital devoted to fundamental studies of disease in man The award was announced by Dr William S Stone, dean of the University of Maryland School of Medicine, who stated that Dr Theodore E Woodward, head of the department of medicine, will be the responsible investigator of the new center Dr Thomas B Connor, associate professor of medicine and head of the division of endocrinology and metabolism, will be the active director The new center will consist of 10 beds, a diet kitchen, and adjacent research laboratories on the third floor of University Hospital The candidate for admission to the center will be a patient whose illness presents a specific medical problem The illness itself may be quite a common one, yet there may be an abnormal underlying biochemical reaction whose clarification may lead to further understanding of the cause of the disease or its alleviation Patients consenting to hospitalization in this unit will receive "the best medical treatment and nursing care possible and will never be subjected to untried procedures or medications which may be harmful or hazardous in any way, yet their participation in intensive studies will assist in advancing the boundaries of medical knowledge There will be no charge for the hospital and medical care, which is a factual recompense for the patient's contribution to the research effort Construction of the University Hospital unit will begin this fall and will probably be completed during 1962

MASSACHUSETTS

Child Psychiatry Symposium—A 3 day symposium on Psychoanalytic Studies in Object Loss and Depression commemorated the 10th anniversary of the founding of the child psychiatry unit at the Massachusetts Mental Health Center Topics under discussion dealt with the emotional disturbances which catastrophic events bring into the life of a child Chairmen of the four symposium sessions were Dr Henry Wermer, clinical associate in psychiatry at Harvard, Dr Eveoleen N Rexford, director of the Thom Clinic for Children and instructor in psychiatry at Harvard, Dr Ives Hendrick, director of medical education at the Massachusetts Mental Health Center and clinical professor of psychiatry at Harvard Dr Eleanor Pavenstedt, associate professor of psychiatry, Boston University School of Medicine

Dr Scrimshaw to Head Department at M I T—The Massachusetts Institute of Technology will create an augmented department, to be named the Department of Nutrition, Food Science, and Technology, and "one of the world's foremost authorities on nutrition" will head the department He is Dr Nevin S Scrimshaw, director of the Institute of Nutrition of Central America and Panama (INCAP) and regional adviser on nutrition of the Pan American Health Organization, Regional Office for the Americas of the World Health Organization Dr Scrimshaw, who is currently an adjunct professor of public health nutrition in Columbia University and a visiting lecturer in the Harvard School of Public Health, will assume his duties at M I T as professor of nutrition and head of the department as of Aug 1, 1961 On coming to M I T, he will maintain an association with INCAP as a technical director Dr Scrimshaw studied medicine at the University of Rochester School of Medicine and Dentistry, receiving an M D degree in 1945 During 1958 he was on leave for studies at the Harvard School of Public Health, from which he was awarded a master s degree in public health in February, 1959

MICHIGAN

Dedication of New Pharmacy Research Building—The University of Michigan College of Pharmacy will dedicate a new Pharmacy Research Building in ceremonies on Dec 1 The U-M Pharmacy Research Building is the first university building in the nation designed and created exclusively for pharmaceutical research It contains laboratories for specific types of investigations and drug preparation processes, and a number of research laboratories for 2 or 4 graduate students Construction was made possible by a grant of $339,500 by the National Institutes of Health, the largest grant made to date by a government agency to a college of pharmacy Additional contributions from the pharmaceutical industry, alumni, and others enabled the creation of the $1,250,000 building The building has 4 stories containing 35,592 sq ft of floor space It is attached to the southeast corner of the East Medical Building The U-M College of Pharmacy was established in 1876 as the first such college at any state university Earlier, instruction in pharmaceutical sciences had been conducted since 1868 in the literary school

MINNESOTA

Personal—Dr Ward S Fowler, consulting physician, Mayo Clinic, and professor, Mayo Foundation, Rochester, has been appointed to serve a 3-year term on the Physiology Training Committee of the National Institutes of Health, U S Public Health Service As a member of the committee, Dr Fowler will review applications for training grants in the field of physiology The program supports research training at a national level for postdoctoral and predoctoral trainees in cellular and mammalian physiology, cardiovascular physiology, neurophysiology, respiratory physiology, and the related biochemical and biophysical areas The work of the committee is administered by the Division of General Medical Sciences of the National Institutes of Health

NEW YORK

Absenteeism Cuts Work Hours 4½%—For every 100 hours of scheduled work time in manufacturing plants in Monroe County, about 4½ hours are lost because of absenteeism This is the conclusion of a year-long survey of local firms made by the Industrial Management Council The sampling includes nearly 20 firms covering about 55,000 employees Absenteeism is on the average about 65 to 75% higher among women

Dr William Bradford Honored—Dr William L Bradford, chairman of the department of pediatrics at the University of Rochester School of Medicine and Dentistry, has been awarded the 1960 Gold Medal of the university's Medical Alumni Association Dr Bradford joined the UR medical school faculty in 1926 as an instructor and rose through the ranks to assistant professor (1930), associate professor (1934), and full professor (1949) He became chairman of the department in 1952 The award, given to a faculty member "in recognition of his integrity, inspiring teaching, and devotion to medical students," was presented by Dr Gilbert B Forbes, professor of pediatrics, at a dinner at the Powers Hotel, and concluded the 3-day 16th annual meeting of the alumni association Dr Forbes is one of the many former students who worked under Dr Bradford Dr Bradford is known for his research on immunity in whooping cough, his special field is in infectious diseases

Personal—Dr Philip B Armstrong, professor and chairman, department of anatomy, State University of New York College of Medicine, Syracuse, has been appointed to serve a 3-year term on the Anatomical Sciences Training Committee of the National Institutes of Health, U S Public Health Service As a member of the committee, Dr Armstrong will review applications for training grants in the field of anatomical sciences ——Prof W W Westerfeld has been named associate dean, in charge of the Graduate School at the Upstate Medical Center in Syracuse, State University of New York Dr Westerfeld will continue in his present position of professor and chairman, department of biochemistry, at the College of Medicine

Russian and New York Academies Hold Joint Pavlovian Conference—The New York Academy of Sciences sponsored, jointly with the Academy of Medical Sciences of the Union of Soviet Socialist Republics, a 3-day psychological conference Oct 13-15 This is believed to be the first time a Soviet academy in the sciences has taken part in such a conference with an American scientific institution The conference chairmen were Dr Nathan S Kline, psychiatrist on the faculty of Columbia University and director of research at Rockland State Hospital, Orangeburg, N Y, and Gregory Razran, Ph D, psychologist on the faculty of Queens College, Flushing, N Y, and chairman of the division of psychology of the New York Academy of Sciences Seven of the most eminent Russian authorities in the field of Pavlovian psychology participated in the conference

New York City

Dr James Tullis to Give John G Gibson II Lecture—Dr James L Tullis, Brookline, Mass, will deliver the 5th John G Gibson II Lecture on Dec 8 at Columbia University, College of Physicians and Surgeons, New York City Dr Tullis' lecture is entitled "Recent Advances in the Preparation and Use of Blood Fractions"

New Mental Health Publication—The New York City Community Mental Health Board has initiated a new series of publications, *NYCCMHB Reports*, designed specifically as a medium for pertinent information for all agencies and individuals engaged in planning and developing mental health services in New York City The first issue of the series was released in late October Subsequent issues will be released intermittently as appropriate information becomes available Certain issues will be devoted to statistical data, others to budgetary and fiscal matters Legislation will be covered The findings of special studies will be reported The October issue presents the latest statistical data on admissions to state mental hospitals from New York City, according to health area, health district, and borough of residence of patients The information was developed by NYCCMHB's staff from data collected by the New York State Department of Mental Hygiene

Dr Lydia Giberson Honored—Dr Lydia G Giberson, assistant vice-president of Metropolitan Life Insurance Company, is the recipient of the 1960 award for The Outstanding Professional Woman of the Year,' given by the Business and Professional Women's Clubs of New York The presentation was made Oct 6 at a reception held at Gracie Mansion, the mayor's residence The award is given annually during National Business Women's Week—celebrated this year between Oct 2 and 8 An award for The Outstanding Business Woman of the Year" is made at the same time The purpose of the awards is to encourage career advancement for women In paying tribute to Dr Giberson, the district director of the Business and Professional Women's Clubs said, in part, Dr Giberson has worked her way up in her field of specialization—industrial medicine—to her present policy-making position has manifested, throughout her career, the characteristics of personal leadership, emotional stability, and mental acumen (and) has contributed to the betterment of our community '

OHIO

Harben Lectures Delivered by Dr Robert Kehoe — Dr Robert A Kehoe, director of the University of Cincinnati College of Medicine Kettering Laboratory, delivered this year's Harben Lectures at the Royal Institute of Public Health and Hygiene in London, England His topic was Metabolism of Lead in Man in Health and Disease The Harben Lectures are part of the Harben Trust created in 1894 by Sir Henry Harben, Master of the Worshipful Company of Carpenters Dr Kehoe is believed to be only the fifth American speaker ever invited to deliver these lectures

OKLAHOMA

Pediatricians to Meet in Tulsa —Hillcrest Medical Center will hold its second annual pediatric colloquy Dec 9-10 The following papers by out of-state speakers are scheduled

- Dr Harvey White, Chicago Pulmonary Emphysema in Infants and Children Congenital Anomalies of the Esophagus with Cineroentgenographic Studies
- Dr Harry L Mueller Boston Danger of Long Term Steroids in Allergic Children Systemic Allergic Reactions to Insect Stings
- Dr Alexis F Hartmann St Louis Proper Examination of the Suspected Hypoglycemic Child Management of Various Types of Hypoglycemia
- Dr Donald J Fernbach Houston Texas Attempted Bone Marrow Implantation in an Identical Twin with Aplastic Anemia, Treatment of Idiopathic Thrombocytopenic Purpura

For information, write Dr Leon Horowitz, Hillcrest Medical Center, Utica on the Park, Tulsa 20, Okla

OREGON

Faculty Promotions —Dr Donald M Pitcairn, associate professor of medicine at the University of Oregon Medical School, will succeed Dr John E Tuhy as head of the division of chest diseases Dr Tuhy will remain on the faculty as associate clinical professor of medicine Dr Pitcairn, who graduated from the University of Oregon Medical School in 1945 served as instructor in physiology at the medical school from 1949 to 1952 He completed a residency in medicine at the medical school in 1953 After 2 years as a research fellow in medicine at Harvard Medical School and as assistant in medicine at Peter Bent Brigham Hospital, Boston, Dr Pitcairn in 1955 was appointed an instructor in medicine at the UOMS

PENNSYLVANIA

Philadelphia

Faculty Promotion —Dr Charles M Norris, of Temple University Hospital's Chevalier Jackson Clinic, has been promoted to professor of laryngology and bronchoesophagology in the School of Medicine Dr Norris, who received his medical school, intern, and residency training at Temple University, has spent his entire professional career at the institution, working with the late Dr Chevalier Jackson and his son, Dr Chevalier L Jackson, head of the department and clinic since 1946 A graduate of Pennsylvania State College, Dr Norris received his M S in laryngology and bronchoesophagology in 1944 and was certified by the American Board of Otolaryngology in 1946

Physicians' Portraits Presented to University —Portraits of 3 distinguished physicians long associated with the University of Pennsylvania Graduate School of Medicine and Graduate Hospital were presented to the university at ceremonies held Sept 29 in the Graduate Hospital Portraits are of Dr Robert A Kimbrough, former professor of gynecology and obstetrics and now medical director of the American College of Obstetricians and Gynecologists, Chicago, Dr Edmund B Spaeth, emeritus professor of ophthalmology, and the late Dr Gabriel Tucker, Haverford, emeritus professor of bronchology, esophagology, and laryngeal surgery All 3 were heads of their departments at the Graduate School of Medicine, as well as department chiefs at Graduate Hospital University participants in the presentation ceremonies included Dr Isidor S Ravdin, vice-president for Medical Affairs, Dr Paul Nemir Jr, dean of the Graduate School of Medicine, and Mr Edwin L Taylor, director of Graduate Hospital The portraits were painted by artist Richard L Seyffert, of New Canaan, and Dr Theodore Cianfrani, associate professor of gynecology and obstetrics at the Graduate School of Medicine

VIRGINIA

State Medical Election —The Medical Society of Virginia elected the following officers for 1960-1961 president, Dr Guy W Horsley, Richmond, president-elect, Dr Russell V Buxton, Newport News, past-president, Dr Wilbur Allen Barker, Roanoke, vice-presidents, Dr Mallory S Andrews, Norfolk, Dr Walter C Elliott, Lebanon, and Dr Harold W Miller, Woodstock, executive secretary-treasurer, Robert I Howard, Richmond, editor, *Virginia Medical Monthly*, Dr Harry J Warthen Jr, Richmond, state health commissioner, Dr Mack I Shanholtz, Richmond, speaker of the house, Dr Fletcher J Wright Jr, Petersburg, vice-speaker, Dr Kinloch Nelson, Richmond

Doctors Hospital Opens—Opening ceremonies were held at the new Northern Virginia Doctors Hospital on Aug 24 and the first patients were admitted on Aug 29 The ultramodern hospital features such innovations as a "continental breakfast" for early rising patients, private phones, radio and television in each room, a glass-enclosed patio, and electronic two-way communications between each bed and the nursing stations Permanent suction and oxygen lines have been installed in each patient's room The hospital is fully equipped to take care of all types of medical and surgical conditions

WEST VIRGINIA

Society News—The following officers were elected at a recent meeting of the West Virginia Division of the American Cancer Society president, Dr Hu C Myers, Philippi, vice-president, Dr Robert J Johnson, Morgantown, secretary, J Ross Hunter Jr, Charleston, treasurer, Paul Davidston, Charleston ——Dr Andrew C Woofter, of Parkersburg, was elected president of the West Virginia Heart Association at the annual meeting at that city on Sept 16 Other officers were elected as follows president-elect, Dr Morris H O'Dell, Charleston, vice-president, Dr Seigle W Parks, Fairmont, secretary Mrs Laurence Mehaig, Wheeling, and treasurer, Mr R E Plott, Charleston (reelected)

GENERAL

World Medical Association Elects Officers—At its 14th general assembly, held in West Berlin, Germany, Sept 15-22, the World Medical Association elected the following officers president, Dr Paul Eckel, Germany, president-elect, Dr Antonio M Aragao, Brazil, members of council, Dr J G Hunter, Australia, Dr L W Larson, U S A, Dr Antonio Spinelli, Italy, Dr Hector Rodriguez H, Chile secretary general, 1961, Dr Heinz Lord, Barnesville, O The Council of the World Medical Association elected the following officers for the coming year chairman of council, Dr Gunnar Gundersen, LaCrosse, Wis, vice-chairman of council, Dr Felix Worré, Luxembourg, executive editor, *World Medical Journal*, Dr Stanley S B Gilder, U K, Dr J R Gosset, France, associate editor The officers of committees for 1960-1961 include International Liaison, Dr Jean Maystre, Switzerland, Medical Education, Dr L W Larson, U S A Medical Ethics, Dr Hugh Clegg, U K, Planning and Finance, Dr T C Routley, Canada, chairman, and Dr L R Mallen, Australia, vice-chairman, Socio-Medical Affairs, Dr Felix Worré, Luxembourg, chairman, Dr Rolf Schlogell, Germany, secretary, liaison officers, Dr Jean Maystre, Switzerland, and Dr Charles Jacobsen, Denmark

Roentgen Ray Society Awards Gold Medal for Exhibit—Dr Llywellyn M Thomas (right), Detroit physician, receives congratulations from Dr Harold G Reineke, Cincinnati, president of the American Roentgen Ray Society, for a scientific exhibit gold medal It is the first such medal since 1952 to be awarded by the Society Dr Thomas is one of a group of 9 Detroit doctors who are co-authors of the exhibit Others are Drs Elisha S Gurdjian, David W Lindner, Warren G Hardy, Maurice M Croll, Steven J Figiel, James E Lofstrom, John E Webster, and Joseph L Whelan All are associated with Wayne State University College of Medicine, and Grace and Detroit Memorial hospitals The gold medal was presented during the 61st annual meeting of the society in Atlantic City, N J

Increased Expenditure on Dental Services Recommended—Results of the most extensive survey ever made of dentistry in the United States were announced at the 40th annual convocation of the American College of Dentists held in Los Angeles Four underlying factors were outlined The American people generally set an astonishingly low priority on dental care, there is an increasing need for more dentists to care for the nation's growing population, despite the country's great wealth, some of its citizens are unable to pay for the comprehensive dental care that is desirable, more extensive use must be made of the auxiliaries in the dental field Recommendations centered on increased capital expenditure for dental schools, construction of new dental schools, fluoridation of communal water supplies wherever feasible, greatly augmented dental care for school children and more extensive dental research

Childproof Medicine Cabinet Developed—A prototype of a childproof' medicine cabinet has been produced by Dr Albert L Chapman, chief of the U S Public Health Service's Division of Special Health Services, and submitted to a newly formed Medicine Cabinet Manufacturers Council in order that a set of manufacturing standards may be developed The cabinet has a special locking device, it has five buttons, three of which are dummies' designed to confuse a child Only the second and fourth buttons, when pressed simultaneously, will open the cabinet, they are placed too far apart for a child's hand to reach both at once

New Air Pollution Division in USPHS—A new Division of Air Pollution, which will consolidate the research, technical assistance, and training activities conducted by the air pollution engineering and medical programs, has been set up in the U S Public Health Service According to Surgeon General Leroy E Burney, the new division will enhance and facilitate the efforts of the Public Health Service to assist states, communities, and industry in their research and control activities in this expanding field of nationwide public health concern' Vernon G MacKenzie, assistant chief, research and development, Division of Engineering Services, will be the chief of the new division

American Psychoanalytic Association Meeting—At the fall meeting, Dec 9-11, 1960, at the Biltmore Hotel in New York City, Dr Ralph R Greenson, of Beverly Hills, Calif, will give the principal scientific address The following panel discussions are scheduled

- Aggression and Symptom Formation
- Frigidity in Women
- Research in Psychoanalysis
- Resistances in Child Analysis

For information, write to the Executive Secretary, 1 E 57 St, New York 22

Physicians Meeting in Boston—The American College of Physicians will hold a regional meeting for the New England States, Quebec, and the Maritime Provinces Thursday and Friday, Nov 17-18, at the Sheraton-Plaza Hotel, Boston No registration fee for guests will be charged, but a fee of $3 will be asked of members to help defray costs Interns, residents, and medical students will be welcome without charge The afternoon of Sept 17 a 'Symposium on Thyroid Heart Disease" is scheduled, with the following papers to be presented

- Biochemistry of Thyroid Hormone, Dr Frederic L Hoch Cambridge, Mass
- Pathological Physiology of the Circulation in Thyrotoxicosis, Dr Lewis Dexter, Boston
- Diagnosis and Treatment of Thyroid Heart Disease, Dr Herbert A Selenkow, Boston

Two panel discussions are planned 'Current Status of Anticoagulation Therapy in Coronary Artery Disease,' moderated by Dr Stanford Wessler, Boston, and Recent Advances in Collagen Diseases,' moderated by Dr Jane F Desforges, Boston Speakers at the annual banquet, Nov 17, 7 P M, will include Dr Chester S Keefer, president of the college, Dr Chester M Jones, president-elect, and Dr Edward C Rosenow Jr, executive director For information, write Dr Rosenow at 4200 Pine St, Philadelphia 4

Society News—The Association of Medical Illustrators has elected the following officers for 1960-1961 president, William A Osburn, art director, W B Saunders Co, Philadelphia, vice-president, Elizabeth B Cuzzort, State University of New York Downtown Medical Center, chairman, board of governors, Professor A Hooker Goodwin, University of Illinois College of Medicine, vice-chairman, board of governors, Eleanor A Sweezey, Queen Mary Veterans Hospital, Montreal, recording secretary, Patricia O'Neill, University of Texas Southwestern Medical School, corresponding secretary, Rose M Reynolds, University of Nebraska College of Medicine, treasurer, Melford D Diedrick, University of Buffalo School of Medicine ——The following officers were elected at the annual meeting of the American Society of Anesthesiologists president, Dr Joseph E Remlinger Jr, Wilmette, Ill, president-elect, Dr Forrest E Leffingwell, Glendale, Calif, first vice-president, Dr Douglass H Batten, San Diego, Calif, second vice-president, Dr Emanuel M Papper, New York City, secretary, Dr Robert L Patterson, Pittsburgh, Pa, assistant secretary, Dr Charles O Hamilton, South Bend, Ind, treasurer, Dr Albert M Betcher, New York City, assistant treasurer, Dr Nicholas DePiero, Garfield Hts, Ohio, speaker, house of delegates, Dr Carl E Wasmuth, Cleveland, vice-speaker, house of delegates, Dr James L Rhee, Oakland, Calif, treasurer emeritus, Dr Moses H Krakow, Bronx, N Y At the same meeting, Dr Harold R Griffith, of Montreal, Canada, was awarded the American Society of Anesthesiologists' 'Distinguished Service Award' for his many contributions to the profession'——The following officers were elected at a recent meeting of the American Society of Facial Plastic Surgery president, Dr Sam H Sanders, Memphis, Tenn, vice-president, Dr John T Dickinson, Pittsburgh, secretary, Dr Samuel M Bloom, New York City, treasurer, Dr Joseph C Miceli, Brooklyn

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated

Area	Oct 22, 1960 Paralytic Type	Oct 22, 1960 Total Cases	Oct 24, 1959 Total
New England States			
Maine	4	1	6
New Hampshire			
Vermont			
Massachusetts		1	8
Rhode Island			2
Connecticut	3	3	4
Middle Atlantic States			
New York	4	13	29
New Jersey	3	4	[illegible]
Pennsylvania	3	6	5
East North Central States			
Ohio	4	4	8
Indiana	2	9	3
Illinois	3	[illegible]	20
Michigan	7	8	9
Wisconsin			1
West North Central States			
Minnesota	1	1	7
Iowa			4
Missouri			21
North Dakota			
South Dakota			
Nebraska		1	1
Kansas			2
South Atlantic States			
Delaware			
Maryland	14	18	2
District of Columbia			
Virginia	7	7	10
West Virginia	6	6	6
North Carolina	3	4	9
South Carolina	1	1	2
Georgia			6
Florida	2	5	6
East South Central States			
Kentucky		10	7
Tennessee	1	1	8
Alabama	6	6	[illegible]
Mississippi			4
West South Central States			
Arkansas			6
Louisiana		1	
Oklahoma			
Texas	[illegible]	[illegible]	16
Mountain States			
Montana	2	2	
Idaho		2	
Wyoming	1	1	
Colorado			
New Mexico			3
Arizona			1
Utah			
Nevada			
Pacific States			
Washington	1	1	7
Oregon			5
California	10	12	9
Alaska			1
Hawaii			
Territories and Possessions			
Puerto Rico	3	3	
Total	96	143	248

New Monthly Bibliography on Arthritis—The National Foundation has announced the publication of a new monthly annotated bibliography on arthritis and related diseases It is being sent initially to 3,650 selected individuals and institutions all over the world The bibliography will cover scientific articles on arthritis appearing in professional journals both here and abroad Entitled *Current Literature—Arthritis and Related Diseases,* it is designed to serve as a comprehensive and up-to-date reference to the vast international literature on rheumatic diseases

1961 Contest for Chest Disease Films—The Committee on Motion Pictures of the American College of Chest Physicians is interested in learning about new films on diseases of the chest (heart and/or lungs) for possible presentation at the 27th annual meeting of the college in New York City, June 22-26, 1961 Films accepted for presentation in the annual motion picture program are eligible for the 1961 film contest The committee is also interested in reviewing new motion pictures for inclusion in the Approved Film List of the American College of Chest Physicians Physicians are invited to forward all pertinent information concerning their films to Dr Paul H Holinger, Chairman, Committee on Motion Pictures, American College of Chest Physicians, 112 E Chestnut St, Chicago 11 Winners of the 1960 College Film Contest are

- First Prize Drs Michael E DeBakey and George C Morris Jr, Department of Surgery, Baylor University College of Medicine, Houston
  "Fusiform Aneurysm of Aortic Arch, Resection and Replacement with Dacron Graft"
- Special Award United States Air Force, Robert B Stonehill, Lt Col, MC, USAF, Technical Adviser, Lackland Air Force Base, Texas
  "Air Travel and the Cardiopulmonary Patient"
- Honorable Mention Chuzo Nagaishi, Tuberculosis Research Institute, Kyoto University, Kyoto, Japan
  "Direct Intracavitary Insufflation with Chemotherapeutic Agent using Metras Catheter via Tracheo-Bronchial Route"
- Honorable Mention Drs Theodore H Noehren, University of Buffalo School of Medicine and Buffalo General Hospital, Buffalo, New York
  "Intermittent Positive Pressure Breathing (IPPB/1)—Its Clinical Application and Administration"

National Science Academy Meeting—The scientific sessions of the 1960 autumn meeting of the National Academy of Sciences will be held at the University of Pennsylvania Nov 14-16 Although the program this year covers all fields of science, there will be notable emphasis on the biological sciences, such as developmental biology, immunology, virology, physiology, and microbiology, and the adjacent field of pharmacolo Of special interest to many will be papers with cancer, heart disease, tissue transpl nd viral infections These papers will be read at concurrent sessions on Monday morning and afternoon and Wednesday morning Scientific studies of broad interest will be the subject of symposiums on Tuesday morning and afternoon

- Tuesday morning Some Current Concepts in Solid Science (Gaylord P Harnwell, chairman)
- Tuesday afternoon Energy-Linked Biological Reactions (David Goddard, chairman)
- Tuesday afternoon Crowding, Stress, and Natural Selection (Carleton S Coon, chairman)

The meeting will close early Wednesday afternoon with the presentation of a color film produced in England to commemorate the tercentenary of the death of William Harvey There will be a luncheon meeting of the National Association of Science Writers Tuesday noon, Nov 15, to which Seymour Cohen, professor of biochemistry at the University of Pennsylvania, will report on 'Some Recent Developments in the Chemistry of Reproduction and Inheritance"

Red Cross to Distribute Vaccinia Immune Globulin —A program for the preparation and distribution of vaccinia immune globulin (VIG) has been established by the American National Red Cross in cooperation with the Armed Forces of the United States This hyperimmune gamma globulin is prepared from blood provided by the Armed Forces from recently vaccinated servicemen There are two situations related to smallpox prevention in which something more than vaccination is indicated (1) known exposure to smallpox, (2) the rare occurrence of complication from the vaccination itself VIG has been developed to give the physician a specific means of managing these conditions Any physician who feels that VIG might be required for a patient should telephone his Red Cross Center

CANADA

World Congress of Psychiatry to Meet in Montreal —On June 4-10, 1961, the Third World Congress of Psychiatry will meet in Montreal under the auspices of the Canadian Psychiatric Association and McGill University The official languages for the congress will be English, French, German, and Spanish The scientific program will take place Monday, June 5, to Saturday, June 10, and will consist of plenary sessions, general sessions, panel discussions, symposiums, and film sessions Simultaneous translation into the 4 official languages will be available for all plenary sessions and many of the other major meetings Film sessions will be held continuously throughout the congress No single theme has been selected, but a grouping of presentations is planned as follows phenomenological or observational, experimental including therapeutic, and interpretive or theoretical A program of entertainment is arranged For information, write the Third World Congress of Psychiatry, Allan Memorial Institute, 1025 Pine Avenue West, Montreal 2, Canada

FOREIGN

New Scientific Journals to Be Published —The Elsevier Publishing Company, Amsterdam, have announced the addition of 3 more journals to their existing list of 11 scientific journals Two of these are completely new, namely, the *Journal of Atherosclerosis Research*, which is expected to gain a wide audience in medicine, biochemistry, and pharmacy, and the *Scientific Reports of the Instituto Superiore di Sanita* This latter periodical will report on research relating to public health carried out at this institute in Rome Finally, *Electroencephalography and Clinical Neurophysiology*, better known as *The EEG Journal*, will be published by Elsevier commencing Jan 1, 1961, with volume 13

World Assembly to be Held in Jerusalem —The 5th World Assembly of the Israel Medical Association will be held in Jerusalem Aug 14-25, 1961 The main themes of the scientific program are the following

- Special medical problems of Israel and the Jewish people Changing prevalence and patterns of disease in Israel
- Progress of research in blood groups of various Jewish communities
- Hemoglobinopathies
- Nutritional anemias
- Chronic pulmonary disease in some ethnic groups
- Prevalence and effect of environmental changes in the incidence of diabetes mellitus in different ethnic groups in Israel
- Familial Mediterranean fever, or recurrent benign polyserositis
- Atherosclerotic cardiovascular diseases in various ethnic groups
- Changing aspects of tropical disease in Israel
- Trachoma research
- West Nile Fever
- Prevalence of mental disease and problems of mental health in Israel

CORRECTIONS

Lucofen for Adiposity —In the letter from Denmark of this title (Aug 27, page 1938), the second sentence should read as follows No toxic side effects were observed and the weight reduction effected by it was significantly more than that effected by a placebo '

One Editorial Year —On page 1195 of the October 29 issue of The Journal, these words were omitted from the quotation of the action of the Board of Trustees The correct statement is as follows 'that it is appropriate for certain editorials that appear in The Journal to carry the signature of the Editor, particularly where the Editorial is concerned with some controversial matter on which neither the Board nor the House has taken action"

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC

Educational Council for Foreign Medical Graduates Stations around the world April 4 Closing date for filing applications is Jan 4 Exec Director, Dr Dean F Smiley, 1710 Orrington Ave, Evanston, Ill

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners *Part I,* June 20-21 and September 6-7, *Part II,* April 25-26 Exec Sec, Dr John B Hubbard, 133 South 36th St, Philadelphia 4

BOARDS OF MEDICAL EXAMINERS

Alabama *Examination* Montgomery, June 20-21 *Reciprocity* Continuously Sec, Dr D G Gill, State Office Bldg, Montgomery 4

Arkansas * *Examination and Reciprocity* Little Rock, Nov 10-11 Sec, Dr Joe Verser, Harrisburg

Alaska * On application in Anchorage or Fairbanks Sec, Dr W M Whitehead 172 South Franklin St, Juneau

California *Oral and Clinical* Los Angeles, Nov 20 *Oral for Reciprocity Applicants* Los Angeles, Nov 19 Sec, Dr Louis E Jones, Room 536, 1020 N Street, Sacramento

Canal Zone On Application Acting Sec, Dr B K Levin, Health Bureau, Balboa Heights

Colorado * *Examination* Denver, Dec 13-14 *Reciprocity* Denver, Oct 11 Exec Sec, Miss Mary M McConnell, 715 Republic Bldg, Denver 2

Delaware *Examination* Dover, Jan 10-12 *Endorsement* Dover, Jan 19 Sec, Dr Joseph S McDaniel, Professional Bldg, Dover

District of Columbia * *Examination* Washington, Dec 12-13 *Reciprocity and Endorsement* Continuously Deputy Director, Department of Occupations and Professions, Mr Paul Foley, 1740 Massachusetts Ave N W, Washington 6

Florida * *Examination* Miami Beach, Nov 20-22 *No Reciprocity* Sec, Dr Homer L Pearson, 901 N W 17th St, Miami 36

Guam *Subject to Call* Sec, Dr F L Conklin, Agana

Hawaii *Examination* Honolulu, Jan 9-19 *Reciprocity* Continuously Sec, Dr Harry L Arnold, Jr, 1000 Ward Ave, Honolulu

Idaho *Examination and Endorsement* Boise, Jan 9-11 Sec, Mr Armand L Bird, 358 Sonna Bldg, Boise

Indiana *Examination* Indianapolis, June 20-22 *Endorsement* Indianapolis, fourth Wednesday each month Exec Sec, Miss Ruth Kirk, 538 K of P Bldg, Indianapolis

Kansas * *Examination* Kansas City, Jan 19-20 *Reciprocity* Kansas City, Jan 21 Sec, Dr F J Nash, New Brotherhood Bldg, Kansas City

Kentucky *Examination* Louisville, Dec 12-13 *Reciprocity* Continuously Sec, Dr Russell E Teague, 620 South Third St, Louisville 2

Louisiana *Examination and Reciprocity* New Orleans, Dec 8-10 Sec, Dr Edwin H Lawson, 930 Hibernia Bank Bldg, New Orleans

Maryland *Examination* Baltimore, June 13-16 (Tentative) Sec, Dr Frank K Morris, 1211 Cathedral St, Baltimore 1

Massachusetts *Examination* Boston, January *Reciprocity* Continuously Sec, Dr David W Wallwork, Room 37, State House, Boston 33

Minnesota * *Reciprocity* November Sec, Dr J P Medelman, 230 Lowry Medical Arts Bldg, St Paul 2

Mississippi *Endorsement* Jackson, Dec 5 Sec, Dr A L Gray, State Board of Health, Jackson

Nebraska * *Examination* Omaha, June Director, Bureau of Examining Boards, Mr R K Kirkman, Room 1009, State Capitol Bldg, Lincoln 9

Nevada *Examination and Reciprocity* Reno, Dec 7 Sec, Dr G H Ross, 112 North Curry St, Carson City

New Jersey *Reciprocity* Continuously *Sec, Dr Royal A* Schaaf, 28 West State St, Trenton

New Mexico * *Examination and Reciprocity* Santa Fe, Nov 21-22 Sec, Dr R C Derbyshire, 227 East Palace Ave, Santa Fe

New York *Examination* Albany, Buffalo, New York, Rochester and Syracuse, Dec 6-9 Sec, Dr Stiles D Ezell, State Education Bldg, Albany

North Dakota *Examination* Grand Forks, Jan 11-13 *Reciprocity* Grand Forks, Jan 14 Sec, Dr C J Glaspel, Box 228, Grafton

Ohio *Examination* Columbus, Dec 12-14 *Endorsement* Columbus, Oct 4 Sec, Dr H M Platter, 21 W Broad St, Columbus 15

Oregon * *Reciprocity* Quarterly Exec Sec, Mr Howard I Bobbitt, 609 Failing Bldg, Portland

Pennsylvania *Examination* Philadelphia, January *Endorsement* Continuously Sec, Mrs Margaret G Steiner, Box 911, Harrisburg

South Carolina *Examination and Reciprocity* Columbia, Dec 13-14 Sec, Dr Harold E Jervey, Jr, 1329 Blanding St, Columbia, South Carolina

South Dakota * *Examination* Sioux Falls, Jan 16-17 *Reciprocity* Continuously Exec Sec, Mr John C Foster, 711 N Lake Ave, Sioux Falls

Texas * *Examination* Fort Worth, Dec 1-3 *Reciprocity* Fort Worth, Dec 1-3 Sec, Dr M H Crabb, 1714 Medical Arts Bldg, Fort Worth

Utah *Examination* Salt Lake City, July 5-7 Sec, Mr Frank E Lees, 324 State Capitol Bldg, Salt Lake City 1

Virginia *Examination and Reciprocity* Richmond, Nov 29-Dec 2 Sec, Dr R M Cox, Portsmouth

Washington * *Reciprocity* Continuously Administrator, Mr Thomas A Carter, Capitol Bldg, Olympia

West Virginia *Examination* Charleston, Jan 1961 *Reciprocity* Charleston, Oct 3 Sec, Dr Newman H Dyer, State Office Bldg, No 3, Charleston 5

Wisconsin * *Examination* Madison, Jan 10-12 *Reciprocity* Madison, Oct 14 Sec, Dr Thomas W Tormey, Jr, 115 South Pinckney St, Madison

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*Basic Science Certificate required

BASIC SCIENCE BOARDS

Alabama *Examination* Birmingham, Dec 20-21 Chairman, Dr E Carl Sensenig, 1818 - 7th Ave So, Birmingham 3

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Nebraska *Examination* Omaha, June Director, Bureau of Examining Boards, Mr R K Kirkman, Room 1009, State Capitol Building, Lincoln 9

Oklahoma *Examination* Oklahoma City, April 14-15 Sec, Dr E F Lester, 580 Home State Life Bldg, Oklahoma City

South Dakota *Examination* Vermillion, Dec 2-3 *Reciprocity,* Dec 12 Sec, Dr Gregg M Evans, Custer

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References (1) Asenjo C F, and Freire de Guzman A R Science *103* 219 (Feb 22) 1946 (2) Clein W H J Pediat *48* 140-145 (Feb) 1956

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MEETINGS

AMERICAN MEDICAL ASSOCIATION Dr F J L Blasingame, 535 North Dearborn St, Chicago 10, Executive Vice-President
1960 Clinical Meeting, Washington, D C, Nov 28-Dec 1
1961 Annual Meeting, New York City, June 26-30
1961 Clinical Meeting, Denver, Nov 27-30
1962 Annual Meeting, Chicago, June 11-15
1962 Clinical Meeting, Los Angeles, Nov 26-29
1963 Annual Meeting, Atlantic City

AMERICAN

1960

November

American College of Chest Physicians, Shoreham Hotel, Washington, D C Nov 26-27 Mr Murray Kornfeld, 112 E Chestnut St, Chicago 11 Executive Director

American Medical Writers Association, Hotel Morrison, Chicago, Nov 18-19 Dr Harold Swanberg 510 Maine St, Quincy, Ill, Secretary

Pacific Coast Fertility Society, Hotel Tropicana, Las Vegas, Nev, Nov 10-13 Dr Anah C Wineberg 3120 Webster St, Oakland, Calif, Secretary-Treasurer

Puerto Rico Medical Association, Santurce, Nov 15-19 Mr Jesus A Sanchez, P O Box 9111 Santurce 29, P R, Executive Secretary

Southern Thoracic Surgical Association, British Colonial Hotel, Nassau, Bahamas, Nov 17-20 For information write Dr Hawley H Seiler, 517 Bayshore Blvd Tampa 6, Fla, Secretary

December

Academy of Psychoanalysis, Hotel Biltmore, New York Dec 10-11 Dr Joseph H Merin, 125 E 65th St, New York 21 Secretary

American Academy of Dermatology and Syphilology, Palmer House, Chicago, Dec 3 8 Dr Robert R Kierland, First National Bank Bldg, Rochester, Minn Secretary-Treasurer

American Rheumatism Association Sheraton Dallas Hotel, Dallas, Texas, Dec 9 Mr Gerard W Speyer 10 Columbus Circle, New York 19 Executive Secretary

Conference on Graduate Medical Education— Educational Problems in the Internship and Residency, University of Pennsylvania Graduate School of Medicine, Dec 1-2 For information write Dr Paul Nemir Jr, 237 Medical Laboratories Bldg, Philadelphia 4 Dean

New York Heart Association, Symposium on the Myocardium, Its Biophysics and Biochemistry, Waldorf-Astoria Hotel New York City, Dec 9-10 For information write Dr Alfred P Fishman, N Y Heart Ass n, 10 Columbus Circle New York 19

Radiological Society of North America, Netherland Hilton Hotel, Cincinnati, Dec 4-9 Dr Donald S Childs, 713 E Genesee St, Syracuse 2, N Y, Secretary

Society of Biological Psychiatry Hotel Roosevelt, New York City, Dec 8 Dr George N Thompson, 2010 Wilshire Blvd, Los Angeles 57, Secretary

Southern Surgical Association, Boca Raton Hotel Boca Raton, Fla, Dec 6-8 Dr J D Martin, Jr, Emory University, Atlanta 22, Ga Secretary

U S Virgin Islands Medical Society, Virgin Islands Hotel, St Thomas, Virgin Islands, December Dr C Warren Smith Knud Hansen Memorial Hospital, P O Box 1201 Virgin Islands, Executive Secretary

Western Surgical Association, Hotel Statler, Detroit, Dec 1-3 Dr John T Reynolds, 612 N Michigan Ave, Chicago 11 Secretary

1961

January

American Academy of Orthopaedic Surgeons, Hotel Americana, Bal Harbour, Miami Beach, Fla, Jan 8-13 Mr John K Hart, 116 S Michigan Ave, Chicago 3, Executive Secretary

American College of Surgeons, Sectional Meeting, Hotel Dinkler-Tutwiler, Birmingham, Ala, Jan 16-18 Dr William E Adams, Am Coll of Surgeons, 40 E Erie St, Chicago 11, Secretary

Clinical Congress of Abdominal Surgeons, Deauville Hotel Miami Beach, Jan 30-Feb 3 Dr Blaise F Alfano, 663 Main St, Melrose 76, Mass

Northwest Society for Clinical Research, Hotel Georgia, Vancouver, B C, Canada, Jan 7 Dr John R Hogness, University Hospital Seattle, Secretary-Treasurer

Western Society for Clinical Research, Carmel-by-the-Sea Calif, Jan 26-28 Dr William N Valentine, U of Calif Med Center, Dept of Med, Los Angeles 24, Secretary-Treasurer

February

American Academy of Allergy, Statler-Hilton Hotel, Washington, D C, Feb 6-8 Mr James O Kelley 756 N Milwaukee St, Milwaukee 2, Wis, Executive Secretary

American Academy of Forensic Sciences Drake Hotel Chicago F 23-25 Dr W J R Camp, 1853 W Polk St Chicago 12 Secretary-Treasurer

American Academy of Occupational Medicine, Statler Hotel D Feb 8-10 Dr Paul J Whitaker, Allis Chalmers Mfg Co, P O B 512, Milwaukee 1, Secretary

American College of Radiology, Drake Hotel Chicago Feb. 8 William C Stronach, LL B, 20 N Wacker Drive, Chicago 6 Exec Director

American Urological Association, Western Section Hotel S Las Vegas Nev Feb 6-9 Dr Edmund Crowley 1930 Wilshire B Los Angeles 57

Central Surgical Association, Park Plaza Hotel St Louis, Feb 16-1 Angus D McLachlin Victoria Hospital London, Ontario Can Secretary

Congress on Medical Education and Licensure, *Palmer House Chicago*, Feb 4-7 For information write *Mrs* Ann Tipner, A M A, 53 N Dearborn Chicago 10

Oklahoma Academy of General Practice Biltmore Hotel, Oklahoma City, Feb 6-7 For information write Dr Leonard R Diehl 2925 N W 50th St, Oklahoma City Okla

Society of University Surgeons University of Kansas Medical Sch Kansas City, Kan, Feb 9 11 Dr Ben Eiseman, 4200 E Ninth A Denver 20, Secretary

March

American Association of Anatomists, Palmer House Chicago Ma 28-31 Dr Louis B Flexner, Dept of Anat, School of Med, Univ of Pa Philadelphia 4, Secretary-Treasurer

American College of Allergists, Statler Hilton Dallas Tex Ma 12-17 Dr Howard G Rapaport 16 E 79th St New York Cit Secretary

American College of Surgeons, Sectional Meetings for Surgeons and Graduate Nurses Hotels Bellevue-Stratford Ben Franklin and Sylvania, Philadelphia March 6-9 Dr William E Adams 40 E Er St Chicago 11, Secretary

American Orthopsychiatric Association, Statler Hilton, New York City Mar 23-25 Dr Marion F Langer, 1790 Broadway, New York 19 Executive Secretary

American Surgical Association Boca Raton Hotel, Boca Raton Fla Mar 20-24 Dr W A Altemeier, Cincinnati General Hosp, Cincinna 29 Ohio, Secretary

Dallas Southern Clinical Society, Statler Hilton Hotel, Dallas, Ma 20-22 For information write the Dallas Southern Clinical Society 4 Medical Arts Bldg, Dallas, Texas

Missouri State Medical Association Hotel Muehlebach Kansas Ci Mar 18-21 Dr John I Matthews 302 Bolivar, Jefferson City M Secretary

National Health Council National Health Forum, Health a Communication Waldorf-Astoria New York City Mar 13 16 Philip E Ryan, 1790 Broadway New York 19, Executive Director

Neurosurgical Society of America (members and guests) Boca Rat Fla, Mar 8-11 Dr Raymond K Thompson, 803 Cathedral St, Ba more 1 Secretary

New Orleans Graduate Medical Assembly, Roosevelt Hotel N Orleans Mar 6 9 Mrs Irma B Sherwood, 1430 Tulane Ave, N Orleans 12, Executive Secretary

Southeastern Surgical Congress Deauville Hotel, Miami Beach, F Mar 6 9 Dr A H Letton 340 Boulevard, Atlanta 12, Ga, Execu Secretary

April

Aerospace Medical Association (32nd annual meeting), Chicago 24-26 Dr Willion J Kennard c/o Washington National Airport, W ington, D C, Secretary-Treasurer

Alabama Medical Association of the State of (members and gues Hotel Stafford, Tuscaloosa, Apr 27-29 Mr W A Dozier Jr, 1 Jackson St, Montgomery 4, Ala Executive Secretary

American Academy of General Practice, Miami Beach, Fla, 13-20 Mr Mac F Cahal Volker Blvd at Brookside Kansas City Mo Executive Director

American Academy of Neurology (members and guests), Shera Cadillac Hotel, Detroit Apr 27-29 Mrs J C McKinley, 4307 E St, Minneapolis 17 Executive Secretary

American Academy of Pediatrics, spring meeting, Sheraton Park H Washington, D C, Apr 10-12 For information write Dr E H Chr pherson 1801 Hinman Ave, Evanston, Ill, Executive Director

American Association of Railway Surgeons Drake Hotel Chic April 13-15 Dr Carl Y Werelius 5800 Stony Island Ave, Chicago Executive Secretary

American Association for Thoracic Surgery, Sheraton Hotel Pl delphia, Apr 24-26 Dr Hiram T Langston, 308 Carondelet B 7730 Carondelet Ave, St Louis 5, Secretary

American College Health Association, Detroit Apr 26 29 Dr man S Moore, Cornell University, Gannett Clinic Ithaca N Y, retary-Treasurer

American College of Obstetricians and Gynecologists, Ameri Hotel, Miami Beach Fla, Apr 21-28 Mr Donald F Richard 79 W Monroe St, Chicago 3, Executive Secretary

American Federation for Clinical Research, Haddon Hall Atl City, Apr 30 James E Bryan, 250 W 57th St, New York 19, Ex tive Secretary

(Continued on page 46)

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JAMA

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Who Will Take Care of the Children?

Clement A Smith, M D, Boston

Predictions are offered as to the medical care of tomorrow's predictably numerous children It is suggested that younger parents and grandparents are willing to assume, and should be given, a larger share in such care, under medical supervision Some of that supervision will require pediatric specialists Most of it should be well within the capabilities of those pediatric generalists who refuse to be bored by it and those family doctors who are willing to keep sufficiently informed in pediatric medicine It is to be hoped that the allocation of children's medical care will not be officially by directive from Washington, the A M A, or the Specialty Boards Children's medical care should be given by those doctors who are most interested and best prepared, many of whom may be not only the children's doctors but also the families' doctors

CHAIRMEN'S addresses are expected to be cogitative and speculative rather than informative Information, the stuff of technical papers, can usually be produced from laboratories or wards, it is not necessarily new, but it is always new-looking because it comes from new tests or new patients On the other hand, speculation and cogitation must come from within They are less apt to be new, or even look new, for the experience, ideas, and speculations of those at the rather standardized age and stage of life which calls for chairmen's addresses tend to be pretty standardized too

How similar are the concerns and reflections of section chairmen was brought home to me when I investigated their addresses lately presented to this Section on Pediatrics of the American Medical Association and found that the ones for 1958 and 1959 were not only upon the subject I thought of talking about, but, moreover, explored it as I would have done (though more gracefully) and arrived at many of the same conclusions The titles of these addresses, "Pediatrics in the Space Age" and 'Pediatrics in Transition,' were once more re-echoed by Dr Samuel Levine in his delightful president's address to the American Pediatric Society last month, wherein he again considered the challenges to all of us under the topic "Pediatrics at the Cross-Roads'

Everyone is troubled about the effects of medical progress and national prosperity on the work of the doctor who specializes in the care of children These factors have not removed the job of the pediatrician, but they have certainly changed it, as many a

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From the Department of Pediatrics Harvard Medical School and the Boston Lying in and Children's Hospitals

Chairman's address read before the Section on Pediatrics at the 109th Annual Meeting of the American Medical Association Miami Beach June 15 1960 well-trained young man has discovered Expecting after his residency to meet and master single-handed the diagnostic and therapeutic problems of what he calls "good" cases, he finds himself, instead, overrun with the same old minor complaints and questions over the telephone, seeing essentially well babies in hospitals, and running a time-consuming, but not very stimulating, well-child clinic in his office He is bored

I agree that this is a problem and a problem arising in considerable part from the success of our specialty It is also caused, as Dr Levine and our own recent chairmen have pointed out, at least in some part by our teaching students not only too well in the past but also about the wrong things in the present and thus fostering the wrong expectations One answer is therefore clear, we must teach more about the three things all normal and abnormal children still do, even though they so rarely have the serious illnesses now seen only, if at all, in large children's hospitals But all children still grow, develop, and behave So we can teach our students about child growth, development, and, particularly, behavior, hoping, perhaps naively, that such knowledge can be applied to the prevention of misbehavior and its serious consequences—accidents and delinquency

I don't know how much we should teach those students who still wish to attempt pediatric practice about various subspecialties such as pediatric allergy, pediatric cardiology, metabolic pediatrics, and neonatal pediatrics The trend toward that kind of practice is certainly visible If it continues and grows, more certified practitioners of pediatrics will specialize and so leave the care of minor illnesses and the prophylaxis of infectious diseases to pediatric generalists, if any of them remain, or to family doctors This is something about which we will offer a few prophecies a little later For the present, it seems wiser simply to be aware of change and alert to the fact that more change is coming than to decide on the basis of insufficient information exactly what should be done about it Incidentally, one of many good reasons for the constant participation of practicing pediatricians in medical school departments is our need for constant and expert information from the field of action Two things we can say without doubt are that there will be a great many more children to be taken care of in the next few decades and for an indefinite period thereafter, and that someone will have to take care of them I would like to think with you for a few minutes today about the potential future roles of three people in this regard One of these is the mother, another is the pediatrician, and the third is the general practitioner, better called the family doctor or perhaps best called the family's doctor

The Mother

I don't think we need to look into statistics to prove that marriage is tending to occur at an earlier age now than 25 years ago Part of this, of course, is in the beholder's eye Parents have become disturbingly young, partly for the same reasons that print is now annoyingly small and people today don't talk as loudly as they used to But it isn't only that the viewpoint of the observer is changing All college educators have become aware of—though the good ones are not necessarily frightened by—the new element of undergraduate marriage, and those who arrange living accommodations for medical students and interns now have to think about where to put wives and children also I like to think this trend toward having—and enjoying—children during or even before the early twenties is an expression of something the advertisers have extolled as "togetherness", anyhow, for the young mother it has necessitated much application of that other modern slogan, "do it yourself" The resultant companionship and relaxation of today's mothers with their children seems to me not only a striking fact but a promise of great hope for the future Along with the desire to have and to enjoy children, there is also an increased desire to do things for them, even those things like delivery without anesthesia, which involves some physical pain, and like breast feeding, which involves some renunciation of that independence which many young women treasured so much only a few years ago I believe those of my obstetric and pediatric colleagues who think young mothers wish to have infants only without pain and to feed them without physical participation are expressing not what they now observe but what they were taught in medical school or observed during their formative years I can't remember when I have been approached by a young mother wanting assured protection from pain or angry that she had not been so protected or by one who had been compelled to nurse her baby when she wanted to feed him from a bottle But I am often reproached by young women because I represent a profession and an institution which has dulled their feelings at a vital time and limited their functions in a vital process Perhaps these girls don't know their own minds, but I think they do I believe not only that they want more active and central roles in perinatal and neonatal pediatrics and are right about wanting them, but that on these feelings can be built a far greater responsibility for the care of well and sick children than we could count on from our not so young mothers of 25 years ago

I would, therefore, urge that in this troublesome question of the medical responsibility for tomorrow's children, we never lose sight of the potential service of today's and tomorrow's mothers Of course, individual exceptions will be taken to whatever I have said about the young women of today, but no one should be blind to a healthy tendency of the many because there will always remain the few for whom motherhood is not basically desirable or is otherwise difficult, usually through no fault of their own. If we or our successors let mothers know of our willingness to share more of the pediatric task with them, their time and their energy—in other words, their partnership—will be freely extended to us. We should never, as the advertisers in their cunning have also perceived, underestimate this kind of power, and I think many of us have done so.

I wish I could perceive a significant change in the father's relationship to his children and predict an expanded paternal as well as maternal future. But with so much of the father's essential role performed at his work, he has had less opportunity to develop an altered role at home. However, with automation and overproduction, he should be prepared for his home life to increase. He may look forward eagerly to this, but he should not forget that his horticultural and constructional activities will have to absorb a great deal of extremely unskilled but persistently offered juvenile labor. Being more juvenile himself, he can probably accept and employ this. If he rejects this kind of partnership, his garden may grow more vegetables and his toolshed be more professionally painted, but what he grows or builds may be basically less productive and useful for the family than it might have been.

Before leaving the role of today's younger parents in the care of tomorrow's children, it might be worth pointing out that young mothers are likely to make superior and extremely useful grandmothers. If the girl babies of today themselves have babies in their early twenties, today's mothers will be grandmothers in their early forties. This should add increased reserves of energy to everything else which has always been good about grandmothers, if doctors will only take advantage of it. Grandfathers will probably continue to be chronically tired.

The Pediatrician

About the medical care of the future, the role of the prophet becomes more difficult. Compared to the central and constant position of the mother and father in the care of children, the position of the pediatrician is only occasional and peripheral. What will he do in it? Several courses have been suggested, and we may well repeat that, for most of them, the medical student and pediatric house officer of today should already be getting a newly oriented education to handle and enjoy the kind of pediatrics they may be practicing tomorrow.

It seems generally accepted that what one writer rather wistfully calls 'the virtuoso pediatrician'—the expert able to recognize, treat, or consult helpfully upon any situation occurring between prematurity and adolescence, inclusive—is disappearing or has disappeared. I catch myself wondering if he ever really existed, and then recalling ward rounds with such men as Kenneth Blackfan, I know that he really did. But now that the field of children's diseases has become so wide and includes so many conditions likely to turn up at an office visit or house call only once or twice in the lifetime of most pediatricians, the inability of any one man to keep track of the whole field is no longer in question. Instead the problem is how many varieties of today's specialists will succeed yesterday's virtuosi, and how many specialists will be needed altogether. Will all pediatricians specialize in some system of the body such as the heart, some physiopathological disturbance such as allergy, or some age period such as the perinatal or neonatal one? Besides these specialists, will there be a few—or many—generalists left to care for the great mass of less-puzzling pediatric problems for which parents and children really do need doctors, the care of which can be an honorable and even gratifying life work?

Surely the specialists are here to stay. One has only to imagine himself asked how he would organize a modern department of pediatrics in a new medical school to sense the necessity for cardiologists, neurologists, hematologists, and a few others who are specialists among doctors for children. It might be asked whether such an academic department of pediatrics based in a general hospital could not do and teach general pediatrics only and refer its infants and children with puzzling circulatory, neurological, hematological, or other problems to specialists in such problems whose essential function is for the adult age group. I don't believe so. We must have experts who know how the growth of an infant affects his congenitally impaired cardiac requirements or how mild spastic paralysis can be fitted into the course of a grade-school education. Economic laws and common sense will presumably settle in time how many of these pediatric specialists we should have. We who teach and practice pediatrics should take the responsibility for seeing that their special knowledge is based on a solid foundation of pediatric information and skill.

I am sure there should be and will continue to be a relatively numerous group of pediatric generalists and that a better education in the realities of modern and future pediatrics should not only make these generalists more enterprising and effective in their jobs but also a good deal happier in them.

Should this be accomplished, as some have urged, by the cultivation of competence in child psychiatry? My own tendency is to agree with D. W. Winnicott[1] that child psychiatry is not something to be picked up in a few months or even a year of postgraduate education and that "the study of the emotional development of the infant, of parental care, and of child care in general is not 'being good with children', it is a different phenomenon—a scientific discipline and a highly complex one, one that makes great demands on the student."

Arguments against the implications of this viewpoint have been well advanced by others.[2] Perhaps there is not so much disagreement as has been supposed, for no one would be against the improvement of pediatric sensitivity, skill, and, above all, patience in dealing with conduct and behavior problems of infants and children But let us not encourage the pediatrician who finds his specialty boresome to attempt any superficial psychiatric approach to harried parents and troubled children

So, let us hope that the 1970's and 1980's will have both the pediatric specialists, whose rare case material may grow even rarer if it becomes possible to prevent congenital malformations or repair more of them soon after birth, and the pediatric generalists, who, as some do even today, will really like to care for the common or minor illnesses of children (which aren't *minor to mothers*), to prevent most of their infectious diseases, some of their behavior disorders, and even a few of their accidental injuries

But only if the general practitioners or family doctors disavow responsibility for and interest in the care of infants and children, as I hope they will not, will all or even most children be medically cared for by pediatricians This brings me to the role of the family doctor

The Family Doctor

Let us start by assuming that there will be some family doctors 20 years from now I think this is a fair assumption, especially when I see how eagerly today's students, who will be the doctors then, are participating in medical-school–teaching programs built around family care These future family doctors are not expected to be able or even willing to do anything and everything, including general surgery, obstetrics, geriatrics, pediatrics, and all the rest That is why I prefer not to call such a doctor a general practitioner and why I like to think of him as the family's doctor or the doctor who recognizes and helps to cope with the effects of the illness of one member on all the members of the family

Many have remarked that the role just described has been successfully and usually involuntarily inherited by the good pediatrician today The pediatrician is sensitive to the epidemic potentialities of illness and thinks automatically of measles, whooping cough, impetigo, paronychia, and even nocturnal crying as diseases or problems potentially affecting the family unit as much as or more than his one original patient The pediatrician cannot take care of a newborn baby without to some extent ordering the life and health of the mother as well, starting with these two, he becomes gradually the doctor for the majority of the family as more and more of them are born into his care And, as all pediatricians know, children don't automatically cease to come to him at any official age

In spite of the tendency to gravitate into this function, I don't think the pediatrician of today wants to take over the role of family medical advisor, and, certainly, he doesn't set out to do so Indeed, it is not likely that he will find time to do so in a future in which there may not be enough doctors of all types to go around What the easy relationship between taking care of a child and taking care of his family suggests to me is that doctors who really want to be doctors of families will neither do their whole jobs nor their best possible jobs for the adults if they leave the children's care and its implications to someone else I don't think the care of children must be assigned to pediatricians, any more than I think only obstetricians can deliver babies But the care of the child may go by default to pediatricians if representatives of the rest of the medical profession are unwilling to assume that responsibility In assuming it, they will, of course, be responsible for keeping up to date in the prophylaxis and treatment of the common diseases of children and in relatively simple principles of nutrition as it affects growth and of development as it affects behavior

So my answer to the question "Who will take care of the children?" begins by recalling that their parents and grandparents should and will take a larger part than they have taken or have been given in the recent past, and beyond the parents there will be certain kinds of doctors One kind, whose limited but important role is easy to perceive, will be the pediatric specialists In proportion to the total population under age 15, it seems to me that relatively few of the children of the future will ever need to take the time of pediatric cardiologists, hematologists, and all the rest Certainly, fewer pediatric specialists should be needed per 1,000 children than the number of adult specialists needed per 1,000 adults

This leaves the medical care of most children either to pediatric generalists or to family doctors I think neither of these medical groups will take care of all the children who don't have congenital heart disease, nephrosis, paralysis, cystic fibrosis, or other indications for specialist care I hope and believe that the assignment of future children's medical care to a pediatric generalist or the family doctor will not be by some fiat laid down in Washington or Chicago but on the basis of which type of doctor is able to do the best job And that means, in the last analysis, the doctor who is interested to the degree of being best prepared I see no reason why the family's doctor shouldn't, with proper interest and preparation, do an excellent job of caring medically for the family's children

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Diagnosis and Treatment of Urinary Tract Infection in Children

A Group of 74 Children with Recurrent Infections Were Studied To Aid in Planning a Therapeutic Program

Ralph A Straffon, M D , and William J Engel, M D , Cleveland

Inadequately treated, persistent, or recurrent urinary tract infections in childhood probably account for many cases of unexplained chronic pyelonephritis producing renal insufficiency in adult life A group of 74 children with recurrent or persistent urinary tract infections were studied to aid in planning a therapeutic program Of 18 children treated with long term antimicrobial therapy and double voiding techniques when reflux was present, 17 had sterile urine at the time of follow up These results were better than those in the group treated by antimicrobial therapy plus urethral dilatation or plastic surgery on the vesical neck with or without reimplantation of the ureter A program for investigation and therapy utilizing this information is presented for the management of urinary tract infection in children

OF ALL infectious diseases, among the most frequently undiagnosed and the most difficult to manage are pyelonephritis and related urinary tract infections They rank second in frequency only to infections of the respiratory tract A few selected data will indicate the magnitude of this problem Active pyelonephritis is found at autopsy in 10 to 20 per cent of cases in many hospitals, and healed pyelonephritis is seen almost as frequently[1, 2] The diagnosis of urinary tract infection was made in only 20 per cent of those patients who at autopsy were found to have active pyelonephritis, and the diagnosis is missed equally often, whether massive or minimal lesions are present[1] Pyelonephritis has been implicated from various degrees of evidence in such disorders as hypertension, chronic renal insufficiency, toxemia of pregnancy, and stone formation[3]

The disparity between clinical diagnosis and autopsy findings indicates that the overt clinical symptoms of pyelonephritis are frequently absent[4] The natural course of pyelonephritis has been described generally as a series of separate episodes of infection At present, evidence suggests that pyelonephritis is a disease continuum, and that in many cases the episodes of acute infection are linked by an asymptomatic but active infection that is constantly taking its toll of renal function[5] The initial event in the relentless course of chronic pyelonephritis may occur during childhood Macaulay and Sutton,[6] as well as others,[7, 8] reported that chronic infection developed in 30 to 60 per cent of children who had urinary tract infections in childhood

The purpose of this study is to review the pathogenesis, influencing factors, diagnosis, and the results of treatment in a group of children who had recurrent urinary tract infection, and to outline a program of therapy

Pathogenesis

In spite of the frequent incidence of urinary tract infections, major gaps exist in our knowledge of the pathogenesis of this disease Bacteria can reach the kidney by four possible routes[3] (1) hematogenous, (2) ascending, (3) lymphogenous, and (4) direct extension Since most urinary tract infections are caused by gram-negative bacteria, the colon seems the logical source of the infecting organism in the majority of cases In the child, the ascending route is probably the most frequent offender The urethra in the female child is comparatively short

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From the Department of Urology The Cleveland Clinic Foundation and The Frank E Bunts Educational Institute

Read before the Section on Urology at the 109th Annual Meeting of the American Medical Association Miami Beach June 14 1960 in length, and retrograde passage of bacteria is certainly feasible •

Influential Factors

Specific Nephrogenicity—Our knowledge of specific nephrogenicity of certain bacterial strains is scanty, but in nearly all types of infection there are strains of high and low virulence, and this certainly may hold true for the urinary tract

TABLE 1—Relationship of Pyuria* to the Bacterial Count of the Urine Specimens of Two Hundred Fifty three Patients†

Bacterial Count/ Ml Urine	Patients, No	Patients with >3 wbc/ hpf, No	Patients with Pyuria, %
No growth	127	15	12
10^{1-3}	50	12	24
10^{3-4}	15	7	47
10^5	61	51	84
Totals	253	85	

*>3 wbc/hpf

†From a study made by Dr Straffon while in the Department of Urology, The University of Michigan Medical School quoted by courtesy of the Departments of Bacteriology and Urology, The University of Michigan Medical School, Ann Arbor, Mich

Genetic Predisposition—The frequent occurrence of urinary tract infections in children with congenital abnormalities of the urinary tract is well known Recently, certain microscopic congenital abnormalities have been reported, such as congenital immaturity of the nephron and microscopic dysplasia These foci may be areas that are particularly susceptible to infective organisms

Specific Host Susceptibility—Host resistance plays an extremely important part in urinary tract infections, as most infections are a delicate balance between states of resistance and growth of organisms Potent nonspecific antibacterial substances have been demonstrated in the normal urine Rowley[10] has recently demonstrated that complement fixation may be an important natural inhibitor of bacterial multiplication The fourth component of complement is inactivated by ammonia Since the renal medulla produces ammonia from glutamine, this may explain why the medullary area of the kidney is especially susceptible to infection There is no specific evidence for renal damage due to specific antigen-antibody reactions or autoimmune phenomena, but, in sensitized animals, bacterial endotoxins will produce severe renal lesions[11]

Functional Defects—Certain functional demands placed on the kidneys would seem to increase the susceptibility to infection The breakdown products of many drugs are excreted by the kidneys, and there is some evidence to suggest that these products may increase susceptibility to the infective organism

Acquired Structural Defects—The structural changes associated with obstructive uropathy or renal parenchymal disease of an acquired nature predispose the kidney and urinary tract to infection

Clinical Diagnosis and Investigation

History—An accurate history of the voiding habits of the child is a most important factor in the management of the urinary tract infection Typical irritative bladder symptoms of frequency, dysuria, and urgency are helpful Often a child will go long periods without voiding simply to postpone the dysuria Chills, fever, pain in the costovertebral angle, and general systemic symptoms should be noted Moreover, there appears to be a large group of children with asymptomatic bacilluria, and in these patients additional diagnostic aids must be utilized

Urinalysis—As a laboratory aid, the first morning voided specimen is the best for examination of the urinary sediment In addition to a careful examination of the fresh specimen, an Addis count may be valuable in quantitating the constituents present Proteinuria is usually not great in pyelonephritis, since there is little initial damage to the glomeruli Table 1 shows the relationship of pyuria to the quantitative bacterial count Although there is a correlation between the presence of pyuria and significant bacilluria, there were specimens in which large numbers of organisms were found with no leukocytes and, at the other extreme, instances in which significant pyuria was reported with no growth on culture In chronic urinary tract infections, only 40 to 50 per cent of patients with bacilluria may show significant numbers of leukocytes in the urinary sediment[4] Few casts are usually found in the urine, for even with severe involvement of the kidneys, in which the tubules are dilated and filled with colloidal material, they are also obstructed so that the casts cannot enter the urine

TABLE 2—Relationship of Findings on Methylene Blue Stain of Urinary Sediment to Bacterial Count in Urine Specimens of Two Hundred Fifty three Patients*

Bacterial Count	Patients, No	Patients with Bacteria Identified on Methylene Blue Stain, No	Patients with Bacteria Identified on Methylene Blue Stain, %
No growth	127	15	12(12% error)
10^{1-3}	50	7	14
10^{3-4}	15	6	40
10^5	61	51	84(16% error)
Totals	253	82	(28% error)

*From a study made by Dr Straffon while in the Department of Urology, The University of Michigan Medical School quoted by courtesy of the Departments of Bacteriology and Urology The University of Michigan Medical School Ann Arbor Mich

The methylene blue staining of the urinary sediment is usually positive for bacteria when 100,000 or more organisms are present per cubic milliliter of urine, but unfortunately there is an inherent error of about 28 per cent, as shown in Table 2[4]

Urine Cultures—In the routine culture of the urine there is the ever-present problem of determining whether or not the organism obtained is a contaminant or a true pathogen The introduction of the quantitative urine culture gives us a method where by true bacilluria may be differentiated from contamination[12] Careful studies have shown that significant bacilluria is present when 100,000 or more bacteria are found in 1 ml of urine Counts of less than 1,000 organisms per cubic milliliter indicate contaminants, and those in the 1,000 to 10,000 per cubic milliliter range are of variable significance[4]

Renal Function—An evaluation of renal function should be made for all patients, to establish a base line for future reference, as periodic evaluation of renal function may play an important role in assessing the response to therapy Any of the standard techniques, such as the 15-minute phenolsulfonphthalein test (P S P), creatinine clearance, or urea clearance tests, if accurately performed, are satisfactory determinants of renal function

Antibody Titers—Erythrocytes which are modified by bacterial antigens are sensitive agents for the detection of bacterial antibodies Antibody titers to specific infective organisms have been identified in urinary tract infections, using the antibody-hemagglutination technique[13] This technique may be useful in differentiating contaminants from significant pathogens, by observing the changes in antibody titers, the response to therapy may be evaluated

Roentgenographic Studies—Intravenous pyelogram should be obtained for all children who have recurrent urinary tract infections The evidence should indicate any possible abnormality that may encourage infection, and will serve as a base line for future comparison of response to treatment

A cystourethrogram made during voiding, preferably with cineroentgenography, is performed on all patients whose infection is recurrent This examination allows an evaluation of the vesical outlet during the act of micturition, and also serves to demonstrate the presence or absence of reflux up the ureters The amount of residual urine is determined at the time the bladder is filled with contrast media, and the efficiency with which the bladder empties can also be noted from the cystourethrogram If the results of intravenous urographic examination prove inadequate for evaluation, a retrograde pyelogram is made at the time of cystoscopic examination

Cystometrogram—All children whose histories, or physical findings, suggest neurogenic lesions of the bladder, should have a cystometrographic examination as part of the diagnostic procedure Urinary tract infections are particularly apt to accur in the child with a neurogenic bladder

Cystoscopy and Panendoscopy—A careful cystoscopic and panendoscopic examination should always be performed on all children with recurring urinary tract infections, prior to starting long-term therapy Obstructive lesions, such as vesical neck contracture, urethral valves, or urethral strictures may be disclosed by this examination The presence of trabeculation and cellule formation in the bladder, and the status of the ureteric orifices should be carefully observed The vesical neck and urethra of the child are difficult to evaluate because of the small instruments needed and the longitudinal infolding of the urethra The difficulty of diagnosing early obstructive changes at the vesical outlet is a problem well known to urologists

Needle Biopsy of the Kidney—Needle biopsy of the kidney is not routinely performed, but in selected patients it may be a valuable diagnostic aid

Results of Therapy

In order to plan a good, modern therapeutic program we first elected to review the records of a group of children who had had recurrent urinary tract infections with a clinical diagnosis of vesical neck obstruction, to analyze the responses to the various therapeutic programs There were 74 children under 14 years of age—61 girls and 13 boys Each had a history of recurrent urinary tract infection Sixty children were treated by conservative measures, and 14 underwent surgical intervention

The 60 children who received conservative therapy could be grouped as follows (1) a small group of patients with sterile cultures at the time of evaluation who received no therapy, (2) a group who underwent periodic urethral dilations plus long-term antimicrobial therapy, and (3) a group who received only long-term antimicrobial treatment Of the 60 children, the pretreatment intravenous pyelograms were normal in 55 (91 per cent), and showed evidence of abnormalities in five patients Nine patients (15 per cent) carried a residual amount of urine of more than 10 ml, but in only three patients was the residual amount more than 30 ml Six patients (10 per cent) showed evidence of unilateral reflux and two (3 per cent) bilateral reflux

The diagnosis of vesical neck obstruction was based on the following criteria (1) panendoscopy, 34 patients, (66 per cent), (2) panendoscopy plus trabeculation, 10 (17 per cent), (3) panendoscopy plus reflux, 6 (10 per cent), and (4) panendoscopy, trabeculation, and reflux, 10 (17 per cent) In the majority of cases this diagnosis was based on cystoscopic observation Considering the difficulty of evaluating the urethra of a child, possibly there were some children in whom there was no significant obstruction

The results obtained with the various conservative therapeutic programs are outlined in tables 3 and 4 In summary, of 21 patients who had sterile cultures at the time of initial investigation, all remained sterile at the time of follow-up Of the 39 children whose specimens of urine showed presence of infection at the time of initial evaluation, 28 (72 per cent) had sterile specimens after therapy Of the 21 patients in the latter group treated with urethral dilations plus long-term treatment with antimicrobials, 11 patients (57 per cent) had conversion to sterile cultures, while of 18 patients treated solely with antimicrobial therapy, 17 (90 per cent) had sterile cultures at the time of their last examinations

TABLE 3 —Results Obtained with Conservative Therapy in Twenty one Patients with Sterile Pretreatment Urine Cultures

	No of Patients					
	No Treatment		Urethral Dilations and Antimicrobial Therapy		Long-Term Antimicrobial Therapy	
Follow-up Period	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture
<6 mo	8		1		5	
6 to 12 mo	1		1			
>1 yr	1		1		3	
Totals	10		3		8	

Fourteen children underwent operation on the vesical outlet for obstruction The surgical procedure was a transurethral resection in seven patients, a vesical neck plastic procedure in three patients, and a vesical neck plastic procedure plus reimplantation of the ureter in four patients The urographic findings before and after the operative procedures are summarized in Table 5 Preoperative urine cultures in this group of children were sterile in five patients (36 per cent), and infected in nine patients (64 per cent) All of the children with sterile cultures had histories of recurrent bouts of urinary tract infection, and all carried large amounts of residual urine The results after operation and long-term antimicrobial therapy are summarized in Table 6 Of the five patients with sterile preoperative cultures, three (60 per cent) had infected specimens at the time of their last follow-up examinations Of the nine patients who had infected preoperative cultures, seven (78 per cent) remained infected (Table 7)

TABLE 4 —Results Obtained with Conservative Therapy in Thirty nine Patients with Infected Pretreatment Urine Cultures

	No of Patients					
	No Treatment		Urethral Dilations and Antimicrobial Therapy		Long-Term Antimicrobial Therapy	
Follow-up Period	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture
<6 mo			3	3	10	
6 to 12 mo			6	5	4	1
>1 yr			2	2	3	1
Totals			11	10	17	1

TABLE 5 —Findings on Preoperative and Postoperative Pyelograms in Eleven Patients who Had Operative Procedures on Vesical Outlet

	No Patients			
		Postoperative Pyelogram		
Pyelographic Findings	Preoperative Pyelogram	Unchanged	Improved	Deteriorated
Normal	5(45%)	5(100%)		
Unilateral Hydronephrosis	5(45%)	1(100%)		
Bilateral Hydronephrosis	1(10%)	3(60%)	2(40%)	
Totals	11	9(82%)	2(18%)	

Program of Therapy

It becomes readily apparent as one surveys the literature that the opportune time to treat a urinary tract infection is during the acute, uncomplicated stage Eighty to 90 per cent of acute, uncomplicated infections can be cured if they are adequately treated with *almost* any antimicrobials[1] The child with an acute urinary tract infection that is manifested chiefly by irritative bladder symptoms and few systemic symptoms is treated with sulfisoxazole (Gantrisin) in the dosage of 0 5 to 1 0 Gm four times daily for from 7 to 10 days The child's infection is then reevaluated, and if it has cleared and the urine culture is sterile, no further investigation or therapy is undertaken Those children who on first examination show evidence of acute pyelonephritis and great systemic toxicity are usually hospitalized and treated with the appropriate medicament as determined by urine cultures and sensitivity studies

TABLE 6 —Results Obtained with Operation plus Antibiotic Therapy in Five Patients with Sterile Preoperative Urine Cultures

	Transurethral Resection of Vesical Neck		Vesical Neck Plastic Procedure		Vesical Neck and Urethral Plastic Procedures	
Follow up Period	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture
<6 mo			1	1		
6 to 12 mo	1					
>1 yr						2
Totals	1		1	1		2

TABLE 7 —Results Obtained with Operation Plus Antibiotic Therapy in Nine Patients with Infected Preoperative Urine Cultures

	Transurethral Resection of Vesical Neck		Vesical Neck Plastic Procedure		Vesical Neck and Urethral Plastic Procedures	
Follow up Period	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture	Sterile Culture	Infected Culture
<6 mo		1		1		
6 to 12 mo		1				
>1 yr	1	3			1	1
Totals	1	5		1	1	1

Children with recurring infections or infections that fail to clear with therapy are evaluated in a manner similar to that outlined above If no abnormalities of the urinary tract are discovered, the child is instructed in a voiding schedule and is treated with the appropriate medicament as determined by cultures and sensitivity studies In addition, the child is placed on long-term antimicrobial therapy, using either sulfisoxazole, nitrofurantoin, (Furadantin),[14] or methenamine mande late (Mandelamine) plus methionine to acidify the urine[4] It is important to study these children and to obtain quantitative urine cultures at monthly intervals to evaluate the effectiveness of the therapeutic program These specimens are collected as mid stream, clean-voided specimens after the method described by Boshell and Sanford[15] Periodic tests of renal function, and intravenous pyelograms are obtained, to observe whether or not there is deterioration of renal function during the course of therapy Antimicrobial therapy is continued until the urine culture is sterile and remains sterile on at least three subsequent cultures The administration of antimicrobials is then stopped, but the child must be followed-up at periodic intervals, and quantative urine cultures must be obtained, to observe whether there is recurrence of the infection

The group of patients who demonstrate abnormalities, such as hydronephrosis, or reflux or obstruction at the vesical outlet must be evaluated with especial care Our data indicate that those children who carry small amounts of residual urine but who have reflux and mild dilatation of the upper tract, should first be given a trial of conservative therapy as outlined above In addition to that program, the use of double-voiding and triple-voiding techniques is important in order to empty the bladder completely at each voiding Reflux can certainly be produced by inflammatory changes at the ureterovesical valve, and may be reversible It is also conceivable that obstruction at the vesical neck may be due in some instances to chronic inflammatory changes and may also be reversible with conservative therapy Leuzinger and associates[16] have reported the effectiveness of conservative therapy in this group of patients

Children with long-standing inflammatory changes, deterioration of renal function, and severe abnormality of the upper urinary tract present real problems in management Vesical neck plastic procedures should be performed to relieve obstruction at the vesical outlet and, in many instances, to prevent reflux the ureter should be reimplanted by means of a technique advocated by Politano and Leadbetter,[17] or by Paquin[18]

Conclusions

Since urinary tract infection in children may initiate chronic pyelonephritis that may progress to renal insufficiency in later life, or to death, it would seem that all diagnostic and therapeutic measures available should be utilized Frequently therapy and follow-up evaluations are inadequate and even unnecessary operations on the vesical neck or ureters may be performed

The data presented suggest that conservative therapy that is vigorous and well managed offers the best chance of curing those childern who have recurrent urinary tract infection Surgical intervention may be necessary if renal function deteriorates during administration of the therapeutic program, or should severe obstructive changes develop In these instances the operation of choice would seem to be a vesical neck plastic procedure with reimplantation of the ureters to prevent reflux A postoperative long-term course of antimicrobial therapy should be administered as an attempt to eradicate the coexisting infection

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New Horizons in Psychiatric Hospitalization

The Psychiatric Revolution

Lauren H Smith, M D , Philadelphia

Psychiatric hospitalization is now regarded simply as a phase in the course of psychiatric treatment, for preventive and therapeutic psychiatry has emerged throughout social, family, group, community, and industrial areas General practitioners are moving closer to comfortable adequacy in dealing with some psychiatric problems The primary significant factor in successful treatment is the doctor-patient relationship Not only psychiatrists but all qualified physicians must fully participate in hospital treatment as well as in home treatment, to the end that hospital care be available quickly and locally In order to move toward this goal, psychiatrists and psychiatric institutions must end their mental, economic, and geographic isolation

THOSE who have spent nearly a medical lifetime in the specialty of psychiatry have been fortunate specialists in a field so interesting and stimulating that possesses a capacity for progressive growth which is broader than some may have anticipated The acceleration of this advance, especially in the last decade, is amazing in the many changes in treatment procedures as well as in hospitalization As a result, these changes contain great challenges not only to the methods of practice but also to the future structure and administration of psychiatric hospitals The historiette of the past is full of significant patterns which need to be modified to match the scientific advance of today

Treatment today, which is very active, is largely made up of two divisions first, somatic therapy, exemplified by the tranquilizers, antidepressant drugs, and electroshock, secondly, intensive psychotherapy, not only in the form of traditional psychoanalysis but also in special techniques for character disorders and chronic schizophrenias as well as re-educational methods in general Child psychiatry has emerged with improved utilization There are increasing numbers of private practitioners in psychiatry The general practitioner recognizes his important role in prevention as well as in therapy

In general, the tradition of the past has been that full-time staff doctors in isolated psychiatric hospitals provide study, care, and treatment, rarely inviting collaboration from the referring psychiatrist and less frequently from the general practitioner This is no longer the optimum program in psychiatric practice Greater effectiveness of psychotherapy by an increasing number of psychiatrists in private practice plus intelligent use of drug therapy by all physicians has improved treatment both inside and outside hospitals

Success in Treatment Changes Need for Hospitalization

Back of this new horizon of opportunity for treatment lies a cogent principle that the primary significant factor in successful treatment is the doctor-patient relationship Spontaneous generation of this prior to acute illness is both prevention and care Maintaining it during illness and in after-care is of key importance To get the greatest advantage from this, not only psychiatrists but all qualified physicians must fully participate in hospital treatment as well as in home treatment to the end that hospital care be available quickly and locally rather than procurable only in isolated private hospitals, state hospitals, or Veterans Administration facilities

The ataractics or tranquilizers with many different names as a group are favorably influencing the management of mental and emotional disorders

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Physician-in-Chief, Institute of the Pennsylvania Hospital

Read before the Section on Nervous and Mental Diseases at the 109th Annual Meeting of the American Medical Association, Miami Beach, June 16, 1960

They prevent psychiatric hospitalization, sometimes through admissions to general hospitals

The antidepressants have yet to prove themselves as satisfactorily as have the tranquilizers Clinical studies are not yet large or complete enough to quiet the cacophonous comparative discussions still heard on the subject in psychiatric hospital centers Psychiatrists in private offices and in outpatient departments report significant aid from these preparations for depression, electroshock statistics at one center indicate fewer treatments for fewer patients, antidepressants for the sicker patients in psychiatric hospitals need further evaluation

In any case, both groups probably delay hospitalization and also make possible earlier discharge Since doctors in general also utilize some of these same preparations in all specialties of medicine and are becoming skillful in their usage, it follows that general practitioners may move closer to comfortable adequacy in dealing with some segments of psychiatric medicine This should be encouraged, inasmuch as the therapeutic advances in psychiatry plus better psychiatric education and experience of all physicians make it possible to broaden the numbers of physicians who may properly help in meeting the demands for treatment in the area of mental health

Closed Staff Policies No Longer Adequate

So far I have outlined some of the current facets of the newer psychiatric trends What has been done to meet some of the problems of the past? What are some of the new methods now in effect which are of interest? A common problem existing in most areas has been the closed staff arrangement found in psychiatric hospitals One hospital, the Pennsylvania Hospital in Philadelphia, has met this by changing staff policies as far as possible Formerly the hospital controlled all therapy, with patients referred from many sources These patients were admitted by a full-time staff who essentially closed the door in the face of the referring psychiatrist or general practitioner even though, in many instances, it would have been desirable for him to follow the patient closely through the therapy period within the institution Admittedly, the patients were well studied, diagnosed, and given treatment in the hospital, and the usual percentage improved, recovered, and returned home When they went home, improved or recovered, they returned to a job or personal environment in which nothing had been done to correct the situation, neither by the hospital, the family in general, a social worker, nor the referring physician, in most instances As the years passed and the concept of dynamic psychiatry emerged in the company of effective psychotherapy and somatic therapy, this picture became more and more incongruous with medical reality

Finally, by the 1950 s, we find a different picture In the Pennsylvania Hospital 25 years ago very few psychiatrists saw their patients in the hospital, but last year 85% of the 500 patients admitted were referred by practicing psychiatrists These physicians came to the hospital and saw their patients once or three times a week, as indicated, and the full-time psychiatric staff and the referring physician worked hand in hand in plans for therapy and, through ancillary personnel within and without the hospital, related much more of the problem to the families and the patients' community Now the "longitudinal concept of therapy" has become the practicing philosophy of the formerly closed psychiatric hospital

There are many administrative problems in a program such as this, but the constructive factors that result, especially for the benefit of the patient, are monumental as compared to the minor problems that exist It is not too much to hope that psychiatric practice in hospitals will soon parallel that which we see in medical and surgical, private and public clinical services

Local Doctors Carry Responsibility in Psychiatric Medicine

At a recent meeting in Philadelphia, Dr Alexander Leighton was discussing the many facets of community psychiatry He told about a successful program carried on by a young psychiatrist, the only psychiatrist in Nigeria, in a vast country of millions of people and thousands of square miles where there are but few doctors but many medicine men This doctor's clinic was located in a central village in a large, rectangular, warehouse type of building, surrounded by a large porch on which the windows of his office opened As he interviewed the patient in his office, almost invariably surrounded by many members of the family and neighbors, neighbors and members of families of other patients were also looking through the windows, hearing the diagnosis or instructions being given, and discussing the treatment advised This certainly is group therapy of a masive sort Some specific aid, however, is transmitted by this psychiatrist to selected individuals He has to send these patients and their families back to the bush His clinic has become popular, his treatments are personal and effective

Now the Mayo Clinic is not exactly in Nigeria, but in the same manner it is somewhat removed from the origin of many of its patients In the psychiatric section of St Mary's Hospital the current-year admissions were 890 patients to 50 beds These patients came from many hundreds of towns and counties in the Middle West and by necessity returned to the point of their original referral An intensive therapeutic program is carried on at this hospital by numerous skilled personnel, and, as in Nigeria, members of the family are involved and help transmit some of the program to be carried out in the home therapeutic setting Here, especially, we see the importance of the local general practitioner and the availability of outpatient care in a hospital both for prevention and for after-care

The definite trend to establish psychiatric sections in general hospitals is not only changing the function of the general hospital but will affect the type of progressive growth and improvement that should take place in all psychiatric institutions A very few years ago there were about 13 general hospitals having some type of psychiatric unit in the large state of Texas Today the number of psychiatric units in general hospitals exceeds 50 In New York State we have heard of increasing success in caring for psychiatric patients in community psychiatric clinics rather than in hospitals Part of this is due to new drugs and especially to the greater skill of psychotherapists, nevertheless, part of it is due to the change of attitude as to where a clinic can be appropriately placed and what kind of patients can be handled in extramural settings for longer periods of time if not for the total time of their illness New York State "has also increased psychiatric facilities in smaller communities to relieve the burden on mental hospitals As many mentally ill patients are treated in their home communities and those who need to enter hospitals are treated there only until they are well enough to return to the community clinics" These are quotes and comments from an article entitled "Mental Health Gains" printed in the *Wall Street Journal*, Oct 23, 1959

Isolation of Mental Hospital Now Obsolete

Such is the interest in our field today There is no longer any reason for the isolation of the mental hospital Such isolation offends the minds of all who comprehend the present and future function of the mental hospital if it is to be participating fully in the field of mental illness and mental health There is a new sophistication in the public mind, and this is something which we must develop The mental hospital no longer can be the responsibility only of the federal government or the state but must be an integral part of community life

It is, therefore, imperative that we as psychiatrists not only run ahead to keep up with these changes as they almost seem to precede us but also plan to make changes in our hospitals Major changes also must originate in the educational system to prepare all physicians for psychiatric practice It is not necessary here to make further comment about this phase of education except to say the whole field of medical education is undergoing upheaval in terms of preparing the general practitioner, especially for his role in psychiatric medicine The activity of the Academy of General Practitioners and other medical groups interested in the better function of all doctors is directed more toward the clinical picture in psychiatry than toward any other specialty The form and type of formal education given to the medical students and to the nurses so that they are prepared to share more of the burden of psychiatric medicine with the psychiatrists is a subject for much broader discussion than can be given here The general practitioner of the future will be medically educated enough, broadly interested enough, and sufficiently capable to carry a good percentage of the present psychiatric practice not now adequately cared for, as well as some of the psychiatric work which the psychiatrist in practice would gladly have him undertake in the crossroads of the community life This is not a proposal to turn over a major segment of psychiatry to the general practitioner but one to support the wide practice of psychiatric medicine by all doctors, in order that prevention be undertaken earlier, treatment be made available more quickly and generally, and mental health be established as a concept throughout all communities Some state hospitals have already brought in general practitioners on a part-time basis and have found these physicians very capable and their work more effective in their own community as a result I recognize that geographic distances and administrative problems make much of this ideation more a fantasy and a hope than an easy fact to accomplish To have a plan and purpose to introduce the physician of the community into our psychiatric hospitals and to bring the hospital closer to the home and the origin of the patient, we find ourselves with unusual opportunity

Most busy general practitioners and psychiatrists in small cities have enough patients who go in and out of the nearby state hospitals so that it would be worth their while to make regular visits there to keep contact with their personal patients If all doctors were permitted to go into the hospital and follow their patients, I think they would welcome an encouraged opportunity, and the patients would get well faster and be ready to go home sooner The doctor who takes a patient home would be in a position to understand and help the psychiatric institution and psychiatrist and make treatment more effective A comprehensive program based on this type of operation is a possibility in the future It should effect the plans to construct as well as the geographic locations of future hospitals A small psychiatric institution seems to be that which is favored at the moment The role of the psychiatric section in the general hospital likewise has its place, nevertheless, there is one principle to be kept in mind If a general hospital has an adequate psychiatric staff and psychiatric consultant who can operate such a unit constructively and satisfactorily, that is fine, but without such a psychiatric staff we might see the development of a miniature "snake pit" and no real progress in modern care These psychiatric units should in no way be a threat to the high quality of care characteristic of psychiatric hospitals, private or public Our role in psychiatric hospitals must change to meet the needs of the psychiatric units in the general hospitals and to form a shuttle service of value to both

The Philadelphia County Medical Society on certain occasions during the year conducts an indoctrination meeting so that each new member who joins the society may be escorted by his sponsor who introduces the new member to others assembled The night I happened to be a sponsor, 92 people were present, 11 new members were psychiatrists and were introduced by 9 different sponsors In other words, over 20% of the doctors present at the Philadelphia County Medical Society meeting that night were psychiatrists I do hope this is an indication of better professional relationships for the future, since psychiatry is sprouting within the general hospitals and is actively taught more practically in the medical schools If general practitioners should have access to our psychiatric hospitals, it follows, therefore, that we as psychiatrists should see to it that we also drift back toward letting medicine help our hospitals as well as ourselves in a broader stream of medical opportunities, activities, and associations

The Council on Mental Health of the American Medical Association held a special meeting for State Medical Society representatives, State Commissioners of Mental Health, and other mental health authorities in November, 1959, to study all aspects of organized medicine in its relationship to the hospitalized psychiatric patient Many important topics were discussed, many conclusions were drawn The conclusion that community resources, embracing hospitals, outpatient departments, rehabilitation programs, community agencies, schools, and all types of professional personnel, should be integrated emerged as the vital and dominating concept This conference pointed up one fact, namely, that psychiatric hospitalization is simply a phase in the course of psychiatric treatment

Changes Needed to Provide New Horizons

To meet the changing status of the needs for hospitalization and community needs in effective precaution, care, and treatment, what are the indicated modifications desirable within the next decade?

First, the function and planning of hospitals should be altered, as follows 1 In psychiatric hospitals, staff relationships like those now characteristic of general hospitals, should be provided for state mental hospitals and veterans' hospitals The staff organization now existing should add open staff privileges to qualified psychiatrists and general practitioners These visiting physicians should be allowed privileges of sharing responsibility for therapy and of charging nominal fees under an approved controlled fee schedule Many patients in public hospitals cannot afford fees but might afford them when outside the hospital, and in such instances most physicians would be willing to continue part-time interest and participation while the patient was in the hospital This is practical, especially since some physicians located reasonably near the hospital would tend to have a concentration of home-town patients hospitalized 2 Psychiatric hospitals should be organized so they include a small acute treatment service, co-ordinated with an outpatient service 3 Emergency psychiatric clinics should be provided in the general hospitals 4 Psychiatric sections should be provided in general hospitals More than one-half of psychiatric admissions today are through the psychiatric sections of general hospitals

Secondly, hospital types, in size as well as location, should be restudied in order that obsolete hospitals be discontinued, small well-staffed treatment centers be established, and facilities for the mentally retarded be established or increased

Thirdly, hospitals should modernize clinical programs to provide outpatient departments and mental hygiene clinics, day hospital service, night hospital service, after-care clinic service, and coordination of these services with community resources as exemplified by the Half Way House, vocational rehabilitation in the community, family counseling services, and school mental health programs, with the primary role centering on the general practitioner

Fourthly, mental health laws should be changed to make effective constructive legislation that will dignify and standardize psychiatric hospitalization so that it may be a much simpler and easier procedure Provision should be made for emergency admissions to institutions only on a medical basis

Fifthly, an open-door policy should be utilized in every sense of the word for patients, doctors, and all concerned, in fact it should be a swinging- or revolving-door policy Staff and employees of hospital should be encouraged to participate in community life Qualified physicians should be encouraged as therapists or consultants to come and go with their patients The goal is to establish the highest degree of communications possible between the hospital staff members and the doctors and families in the community

Most of us as psychiatrists believe that the quintessence of value in therapy is the personal contact of doctor and patient and that our somatic or psychotherapeutic techniques depend on the quality of that relationship If this be true, then for the best practice in psychiatry and for the proper function of hospitals in the future, let us provide patients the fullest continuous therapeutic contact Willingness to change our present system, enlisting bold imagination for the future, will provide unrealized opportunities for effective therapy

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Postoperative Massive Collapse of the Lungs

John G Raffensperger, M D , W G Diffenbaugh, M D , and E Lee Strohl, M D , Chicago

Two patients have been encountered who died immediately after operation with pulmonary collapse Each patient underwent a prolonged operation to correct esophageal obstruction and then suffered severe hypoventilation and died before adequate resuscitative measures could be instituted The literature was reviewed for previous clinical reports of this syndrome as well as reports of experimental work that has been done to determine the etiology of massive atelectasis

The combination of respiratory depression, rapid absorption of gas from the alveoli, and bronchospasm secondary to vagus nerve reflexes was responsible for the production of massive pulmonary collapse To prevent this complication, repeated doses of atropine during surgery, hyperventilation with room air at the end of anesthesia, and mechanical respiratory assistance in selected cases are suggested

IN 1835, Jorg[1] originated the term "atelectasis" from two Greek words "ateles," meaning incomplete, and "ektasis," meaning distension In a series of publications from 1850 to 1855, Gardner[2] differentiated atelectasis from pneumonic consolidations He showed that the etiological factor in most instances of atelectasis was bronchial obstruction Pasteur, in 1890,[3] reported 30 cases of massive collapse of the lungs which occurred after diphtheritic paralysis of the diaphragm He found complete collapse of the lungs but with no autopsy findings of bronchial obstruction

Experimental studies in the dog have demonstrated that complete bronchial obstruction with a balloon will not produce immediate collapse[4] Four or five hours are required for the absorption of air from the alveoli If the animal is breathing pure oxygen, carbon dioxide, or nitrous oxide at the time of occlusion, collapse will develop more rapidly Absorption of gases occurs more rapidly than the absorption of air, which contains more nitrogen If plugs with valves are used for the obstruction of the bronchi, which permits gas to escape but not to reenter, collapse may occur rapidly[4]

Galbraith and Steinberg[5] showed experimentally that the underlying basis of atelectasis is a serious interference with the respiratory movements of the lung The interference may be of many types, such as diaphragmatic limitation of movement, injury of the chest wall, obstruction of the bronchi, and reflex spasm He found that temporary, though complete, obstruction of the bronchus does not lead to atelectasis unless the obstruction has been present sufficiently long to produce pulmonary edema and pneumonitis Such an obstruction, necessary to produce atelectasis, requires 24 hours in the dog

De Takats, Fenn, and Jenkinson,[6] in a study of the reflex effects of pulmonary embolism by bronchography in dogs, showed that bronchospasm followed by atelectasis was a sequel of pulmonary embolism Intra-abdominal manipulation produced bronchospasm and atelectasis by reflexes through the vagus nerves Sixty per cent of these changes could be abolished by section of the vagus nerves or by the use of atropine

The progression of events in atelectasis is a congestion of the capillaries of the alveoli, with reduction of the air space to mere slits, as well as edema of the lung tissues This pathology occurs in the presence or absence of obstruction of the bronchi

Report of Cases

CASE 1 –A 5-year-old girl had been treated for a lye stricture of the esophagus for three years by retrograde bouginage through a gastrostomy She was unable to maintain a satisfactory nutritional status She was admitted to Cook County Hospital for a retrosternal right colon transplant Routine physical examination and laboratory reports revealed normal findings Barium study and esophagoscopy revealed a stricture of almost the entire length of the esophagus At operation the involved esophagus was bypassed with the right colon and terminal ileum The colon, with

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From the Department of Surgery Cook County Hospital Dr Raffensperger is now at the Marshfield Clinic Marshfield, Wisc ileum was brought through a substernal tunnel, and anastomosis was carried out in the neck between the ileum and esophagus The distal colon was anastomosed to the fundus of the stomach Anesthesia induced with cyclopropane and ether through an endotracheal tube was used for the major portion of the procedure and nitrous oxide-oxygen was used to maintain anesthesia during the closure Upon removal of the endotracheal tube, she developed a faint inspiratory stridor The color remained good and the pulse of good quality The respiratory exchange was believed to be adequate She was removed to her room, where she was placed in an oxygen tent, with Alevaire One hour after surgery she died in considerable respiratory difficulty, as a tracheotomy was being performed The postmortem showed a bilateral massive collapse of the lungs There was minimal edema of the trachea and bronchi Neither pleural cavity had been entered, and no significant secretions were present in the tracheobronchial tree (fig 1)

Case 2 —A 63-year-old man entered Cook County Hospital with a squamous cell carcinoma of the middle third of the esophagus Nutritional preparation was carried out with suitable feedings and intravenously given fat emulsions Roentgenograms showed that the lung fields were clear At operation through an abdominal and right thoracic approach, two-thirds of the esophagus was resected and the stomach mobilized and anastomosed to the esophagus at the apex of the right pleural cavity Anesthesia was induced with thiopental (Pentothal) sodium and maintained with cyclopropane-ether and muscle relaxants At the termination of the procedure he was hyperventilated with nitrous oxide-oxygen Except for several minor episodes of hypotension during retraction of the lung, the course throughout the operation was uneventful At the termination of the procedure the blood pressure was 110/80 mm Hg and the pulse rate was 100 per minute En route to the recovery room, the respirations became gasping in nature and a mild cyanosis developed The patient improved with nasal oxygen and tracheal aspiration After a short period of improvement, the level of unconsciousness deepened and the respirations became labored A tracheotomy was performed and the patient was treated with the Morch respirator He died a few minutes later The autopsy examination showed bilateral massive pulmonary collapse and a small amout of blood in the right pleural space The left thoracic cavity had not been entered The lungs were mildly edematous but contained no appreciable secretions (fig 2)

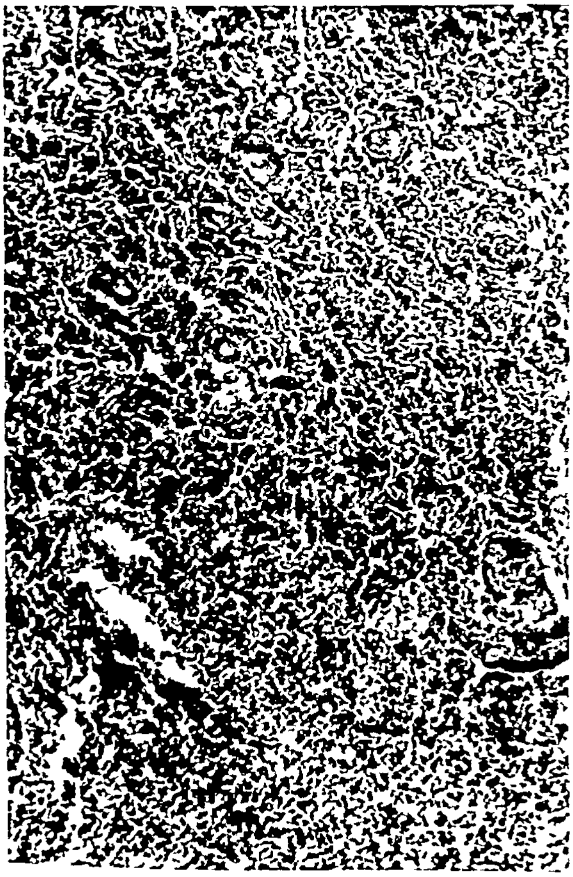

Fig 1 (case 1) —Microscopic section of lung showing complete collapse of alveoli and absence of fluid

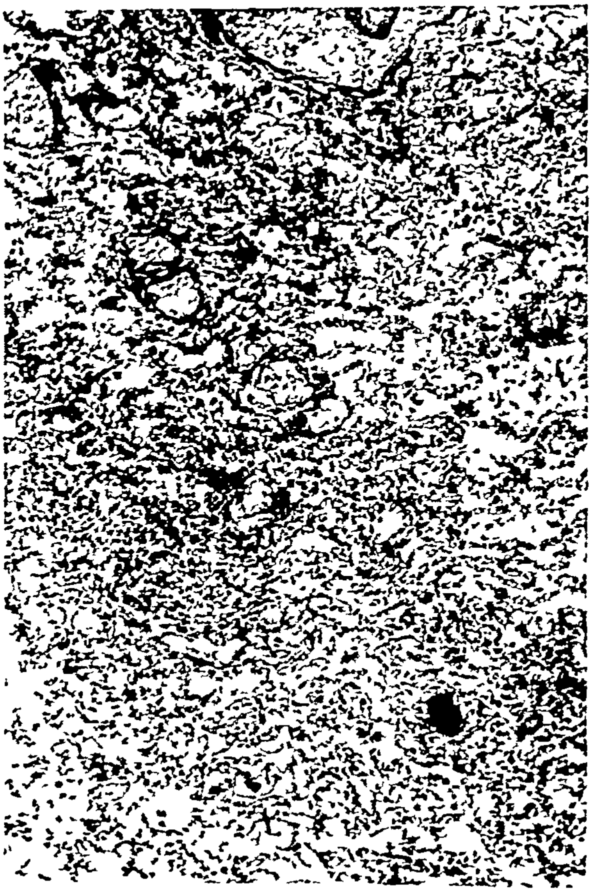

Fig 2 (case 2) —Microscopic section of lung showing collapse of some alveoli, fluid in other alveoli, and dilation of vascular spaces with blood

Comment

Massive collapse of the lungs is not uncommon after a variety of operative procedures, including tonsillectomy, orchiopexy, and parturition[7-11] Our two patients had esophageal obstruction Each patient had been under prolonged inhalation anesthesia and had been given muscle-relaxing drugs Hyperventilation was carried out at the end of each procedure with nitrous oxide and oxygen Both gases are absorbed rapidly, facilitating rapid collapse of the lungs The operations involved manipulation and traction on the vagus nerve, which produces reflex bronchoconstriction and pulmonary vasodilatation Both patients manifested signs of pulmonary collapse shortly after the termination of the operation

Measures directed at clearing the lungs of infection and secretions prior to surgery should be pursued until the tracheobronchial tree is dry Other factors in the prevention of immediate postoperative atelectasis have been less well emphasized The usual preoperative dose of atropine loses its effectiveness in a short time Administration of atropine should be repeated during the course of prolonged operations in order to reduce the vagal reflexes Long anesthetic procedures with rapidly absorbing gases displace nitrogen from the lungs It is preferable for the anesthetist to utilize atmospheric air for ventilation, at the termination of the anesthesia, rather than nitrous oxide and oxygen

The ultimate in prevention of atelectasis is the prophylactic use of tracheotomy and a mechanical respirator Tracheotomy has been advocated in patients with carcinoma of the esophagus by Reynolds and others [12] We think that tracheotomy alone would not have been sufficient in either of these patients The use of a mechanical piston respirator of the Morch type will maintain aeration of the lungs under the most adverse conditions of postanesthesia respiratory depression and patient fatigue

Summary and Conclusions

Two patients who had early postoperative massive collapse of the lungs have been discussed Postmortem examinations in these patients failed to reveal the usual causes of atelectasis Specifically, there were no bronchial secretions or obstruction, nor was there pulmonary compression

We feel that the combined factors of prolonged anesthesia with depressing drugs, the rapid absorption of highly diffusible gases at the termination of the anesthesia, and reflex bronchospasm combined to produce this syndrome Suggestions for the prevention of this catastrophe include more vigorous efforts to prevent vagal reflexes during surgery and hyperventilation with room air to displace more rapidly absorbed gas from the lungs Finally, mechanical respiratory assistance will be necessary in selected patients who exhibit symptoms of hypoventilation in the period immediately after operation

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THE MOBILITY OF THE BRONCHIAL TREE—As both ends of the trachea may move, observation of its behaviour is complicated On inspiration the larynx may descend, ascend, or remain unchanged—its maximum movement in either direction being 6 mm In their studies of tracheal movement W S Holden and G M Ardran used bronchography and cine-radiography, these providing an ideal method of following the bronchial tree throughout respiration In 50 bronchograms, taken from subjects between 12 and 65 years of age and free of bronchial abnormality, they found that during deep inspiration the trachea increases its diameter by about one-tenth and its length by about one-fifth—the latter increase being equivalent to about 2 5 cm The main bronchi resembled the trachea, but in more distal ones the range of movement was greater In coughing, the trachea and bronchi showed the narrowing and shortening typical of a forced expiration, both during momentary closure of the larynx and after it had opened—that is to say, there was no dilatation of trachea and bronchi, the upward movement of radio-opaque material being seen only in large bronchi In violent paroxysms the reduction in diameter of the trachea was as much as one-half to two-thirds In health, then, the trachea is extremely mobile, able to extend and shorten with great rapidity—Shape of the Trachea, article, *British Medical Journal*, Jan 2, 1960

Frontiers of Physical Medicine and Rehabilitation

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Since the advent of sulfonamides and antibiotics the physician finds his time taken up less by infectious diseases and more by the chronic diseases of an aging population It is important that restorative services be available and that physicians know about rehabilitative agencies available within their communities For amputees, new types of protheses are being developed for both lower and upper extremities, the fitting of a prosthesis and training of the patient to use it are essential steps in his rehabilitation The physiatrist functions as a diagnostician, a physician, and a director of broad rehabilitative programs It can be shown that the economic gain from a good program of rehabilitation far exceeds its cost

AN EMINENT historian, Carl L Becker, has said "The past is a kind of screen upon which each generation projects its vision of the future" In 1925, Dr William J Mayo said Rehabilitation is to be a master word in medicine " The insight expressed by these two thoughtful analysts is important to us in the specialty of physical medicine and rehabilitation, particularly as we enter the decade of the 60's—a decade of great potentiality, challenge, and opportunity What will be the dominant concept in this coming decade? What will we accomplish as a result of our past and present experiences, and how will this help the growth of our specialty as well as the health and welfare of our patients? Today, the words rehabilitation" and antibiotics" are the master words in medicine

History

There have been many events with long-range implications which have contributed to the evolution in the practice of medicine They have had a particularly profound effect on the area of physical medicine and rehabilitation During the early 1900's and World War I, interest in what is now physical medicine was exemplified by the government establishment of a Division of Special Hospitals and Physical Reconstruction However, the armistice in 1918 resulted in rapid demobilization of trained medical personnel and major failure in this effort During the next era, the physician spent 95% of his time in the care of patients with acute infectious diseases The average span of life was about 55 years at that time Sulfonamides gave medicine its first weapon in this battle in the 1930 s, and this was followed by penicillin, the greatest impact against infectious diseases

During World War II, physical medicine and rehabilitation reached its optimum acceptance with the establishment of a certification board in the special field of physical medicine in January, 1947 Two years later (January, 1949), the name was changed to the American Board of Physical Medicine and Rehabilitation Momentous progress in public health and sanitation improved man's standard of living with further control of lethal disease processes With the advent of the newer antibiotics (mycins), physicians gained considerable control of infectious diseases, and the evolution in medicine became more complete except for viral infections, in which much progress continues to be made in the departments of virology

Awareness of Present Role of Physiatry

In what have these and other scientific advances culminated? Basically, the life span of man has increased 50%, or an average of 72 years today, what will it be in the year 2000? As a result of this evolution in medicine, chronic disease and its resultant problems have become a paramount factor in successful rehabilitation of patients Those of us in this specialty and allied areas have a unique challenge regarding our present role in relation to the social-economic impact of chronic disease, orientation of physicians in rehabilitative services,

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Chairman Department of Physical Medicine Professor Physical Medicine and Rehabilitation Baylor University College of Medicine

Revision of a Chairman s Address read before the Section on Physical Medicine at the 109th Annual Meeting of the American Medical Association Miami Beach June 15 1960 vocational goals of disabled patients, research in prosthetics and orthotics, and the physiatrist's present-day role

There are many complex factors in chronic disease from a physical as well as social, economic, and psychological level which often create greater complications within the family, community, and industry than the physical disease itself Physical involvement often results in economic hardship manifested by frustrations and anxieties, sometimes affecting four to five members within the same family and often resulting in family placement on dependent welfare roles of society

We must be aware of that opportunity of offering restorative services to many communities where there is a substantial backlog of patients who need rehabilitative services Evaluation of the total problems in chronic disease is indicated rather than practice of a "sterile type" of therapeutic medicine with the result that the patient is "stranded" either in an institution or at home to vegetate through neglect

Many physicians are unaware of available rehabilitative services as noted by a recent committee report of the American Medical Association This random survey of physicians, conducted in a populous county, revealed that only one-third of those physicians knew of the existence of a state rehabilitation agency, another one-third, although they recognized the term, knew little or nothing about its operation Only 5% had any idea of eligibility requirements for service and one-half of those physicians were in institutional practice

We believe that physical medicine and rehabilitation should be practiced by competent specialists, but it is important that these services be available to all physicians It is equally important that physicians be made aware of these services within their communities In this regard, the American Medical Association has taken a step forward by establishing a Rehabilitation Committee at national and state levels as well as within each county medical society to develop a directory of available rehabilitation agencies and facilities for indicated patient care Some communities already have well developed directories, but others have none I feel sure that with such directories, with additional education, training, and research endeavors, more and more physicians within each county will become aware and better utilize rehabilitation facilities in the care of their patients

Why most physicians in their practice of medicine seldom recognize the opportunities for services for the disabled when these obligations are not immediately concerned with the acutely ill patient is not known Perhaps it may be our method of medical education or our concern with only specialized interests Although great advances have been made in medicine, bio-engineering and public health, often by lay leaders, it is our responsibility as physicians to improve methodology in techniques of rehabilitation and education of professional personnel through teaching, research, and services Today, in the field of rehabilitation, great emphasis is again being placed by lay leaders and others, and much of our progress has been due to these men They have recognized the need for special medical competence within this field and its acceptance by all who are engaged in medical practice It is necessary that we, specialists within the field of physical medicine and rehabilitation, provide additional support and accept our responsibilities

If physicians in the practice of medicine in a well established community are unaware of available facilities for rehabilitation, it would seem apparent that high school and university counsellors also need to be oriented in our specialty and be made aware of the opportunities available for advancement, research, and training Our population is increasing by 3,000,000 annually There are 68,000,000 children under the age of 20, 43,000,000 persons are going to school, of which over 3,000,000 are enrolled in colleges and universities throughout the United States

What is our responsibility for the orientation and establishment of interests of these students in the broad field of medicine and, secondarily, to the specialty of physical medicine and rehabilitation? Recruitment and training of physicians and allied personnel in the field of rehabilitation is one of the greatest single problems of today It is necessary to evaluate training programs and to determine how we are preparing allied personnel and physicians to meet their obligation There must be improved and expanded training programs in basic sciences and research in order to prepare specialists within the field to assume their responsibilities in the practice of physiatry

As a result of emphasis placed on rehabilitation of patients with poliomyelitis, great advances and achievements have been attained and are adaptable to many patients with other disabilities Today, however, there are more than 2,000,000 disabled persons with residuals of cerebrovascular accident, and there is need for a concerted effort to increase the rehabilitation potential of such people Through such endeavors, many disabled patients can be assisted, through retraining, to live and work within their limitations and to the extent of their capabilities In this regard, industry needs to be oriented and educated to accept the philosophy that work is a normal way of life and physically and emotionally good for men In facilitating the physiatrist in the evaluation of vocational potentials for his patients, basic principles that permit assessment of functional and vocational capacities are necessary

We, as physicians, concentrate on disease and disability, but how much do we concentrate on scientific determination of ability? Is our information opinionated and lightly determined? We should define and diagnose ability in the same sense we diagnose disability, and, when properly applied, it will greatly enhance prevocational evaluation and potential placement Too much vocational categorization of individual patients by the broad terms of disability is a psychological trap for physician and counsellor, resulting in rigid concepts and stereotyped job groupings All of us are fit and unfit simultaneously and, generally, no one individual is physically, emotionally, or socially fit for several vocations Our task is to determine the balance of fitness and unfitness in each of our patients in relation to the various activities of work in his vocational objective Industry has become highly specialized, and, if we can evaluate the patient's capacity to perform a particular limited job, e g, 'apply formica" rather than 'general carpentry," we would increase potentials of placement for the severely disabled who, for several reasons, might not be able to achieve the broad vocational objective

During the past 15 years with the technological and scientific resources of professional and industrial personnel, considerable biomechanical improvements have been accomplished through research in prosthetics at various medical centers, industrial firms, and federal agencies This knowledge has been disseminated through courses offered at medical centers to physicians, surgeons, therapists, and prosthetists Today, we find the orthopedic and prosthetic appliance clinic team in major hospitals, medical centers, and rehabilitation institutions, daily applying those prosthetic principles as developed through these vast research projects Through these clinic team activities, the amputee patient has greatly benefited through the improvements made in prosthetics Additional prosthetic research has resulted in the development of the standardized prototype above-knee temporary prosthesis The principles of this prototype unit have permitted many amputees of older age with chronic multiple disabilities, because of increased life span, to be objectively evaluated and, when indicated, successfully fitted with permanent prostheses

Many of us who have participated in the prosthetic educational program have been concerned with the development and improvement of orthotics and are aware of the need of a similar research endeavor, particularly for the patient with upper extremity problems Hundreds of thousands of patients with residual paralysis exemplify the need of such research for development of an orthotic program with a rationale, principles, and techniques which will lead toward their functional independence within their limitations Considerable research is being accomplished by physicians, orthotists, and therapists associated with varying educational institutions However, there is a lack of financial support to bring about significant improvement in the field of orthotics with the inauguration of training programs for professional personnel

Comment

What is physical medicine and rehabilitation? It is often thought of as the application of physical modalities in physical therapy and use of techniques of occupational therapy Comparing the role of the physiatrist 15 years ago with that of today, one finds rather marked changes have occurred with the growth and development of physical medicine and rehabilitation At that time, considerable emphasis was placed on the physiological effects of the various physical therapeutics as used in the treatment programs Often and still prevalent, the physiatrist functioned between the referring physician and the therapist in application of treatment to the patient Such programs were found in general medical and surgical hospitals, and often the physiatrist was a "salaried employee" Residency training and research programs then emphasized clinical programming with no "on service" patients, and the resident was seldom responsible for the complete medical evaluation of the patient as well as treatment within the realm of physical medicine and rehabilitation Thus, the resident's and physiatrist's responsibilities were limited basically to physical restoration through consultation With the advent of rehabilitation centers, the physiatrist's role began its evolution up to date and his interest can be fulfilled Now he should function both as a physician, specialized in principles and philosophy of physical medicine and rehabilitation, and as a diagnostician skilled in the treatment of those patients with neuromuscular and muscle-skeletal disease entities The director of such broad rehabilitative programs needs the services of paramedical personnel, interpreting and coordinating their findings into a complete organized rehabilitation program Thus, the scope of physiatry is complex and encompasses many aspects of total medicine beyond the confines of individual medical practices

Although the health of our nation has improved remarkably, we are still confronted with many problems, particularly in the social-economic aspect of chronic illness, prosthetics and orthotics, orientation of industry, and our own role within this specialty Although progress in medical research has been very good, the practical application of many factors is still necessary During the last 15 years, research in medicine, particularly in the fields of surgery, rehabilitation, and utilization of antibiotics has saved the lives of 1,800,000 people and the earnings of these men and women, through vocational productivity, has exceeded 3 5 billion dollars Thus, the investment has been small but the dividends great for the progress that has been accomplished in rehabilitation The span of life has been greatly increased, but it must also be made more useful and enjoyable through our efforts in rehabilitation

1333 Moursund Ave

JAMA, Nov 12, 1960

Muscle Pain After Administration of Succinylcholine

A Comparative Study

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An incidence of muscle pain as high as 90% has been reported after the use of succinylcholine as a relaxant in surgical patients In the present study the incidence was determined in a total of more than 400 patients The succinylcholine was administered intravenously, usually in a single rapid injection Doses ranged from 10 to 100 mg A statistically significant, though small, incidence of 6% was observed The incidence was not significantly higher among patients receiving the larger doses The difficulty of distinguishing muscle pain that might be induced by the relaxant from other types of postoperative pain was recognized It is concluded that the use of succinylcholine is associated with a small but definite incidence of postoperative muscle pain

SEVERAL European authors have reported disturbingly high incidences of muscle pain after administration of succinylcholine Churchill-Davidson[1] reported that 66% of patients released from the hospital on the day of operation developed muscle pain, and two-thirds of these were incapacitated by the pain Five of 36 patients who were kept in the hospital complained of muscle pain, and 3 of these were ambulatory within the first 24 hours Leatherdale and his co-workers[2] found a 36% incidence of pain Out of 100 patients undergoing endoscopic procedures, Mayrhofer[3] found 51 with severe pain, 38 with intermediately severe pain, and only 11 free of muscle pain Morris and Dunn[4] found that 35% of dental patients had muscle pain when discharged on the first postoperative day On the fifth postoperative day these patients were again evaluated, and by this time 72% complained of muscle pain

If these reports do indeed represent the incidence of muscle pain after administration of succinylcholine, one may well be justified in using other relaxants It was decided therefore to investigate the incidence of muscle pain in our patients

Method

Patients were evaluated for muscle pain on the first and third postoperative days, and notations made on a special report form Three series were recorded In the first, the physician administering anesthesia furnished a report on each patient receiving succinylcholine These reports comprised the "known" series In this series the evaluator knew the object of the study and knew the drugs given the patient The dose of succinylcholine varied from 10 to 60 mg , usually 20 to 40 mg

For the second series, the authors evaluated all patients given anesthesia by the department The evaluator had no prior knowledge of the type of anesthesia administered The same observations were made as were made on patients known to have had succinylcholine After the evaluation, the anesthesia given was determined These reports made up the "blind" series The "blind" series was subdivided into patients receiving succinylcholine, patients receiving general anesthesia without succinylcholine, and patients receiving regional anesthesia

In the third series, patients were given 100 mg-single doses of succinycholine instead of the 20 to 40 mg-doses usually used in our department These patients were evaluated by the physician administering the succinylcholine, and one of us, and constituted the "100 mg series'

The "known" series and the "blind" series were observed at overlapping times, so that some of the patients were evaluated both ways In only one instance did the two observers get different answers

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The succinylcholine was administered intravenously usually in a single rapid injection No effort was made to give the drug slowly or to titrate the doses in any way In a few cases intravenous infusions of dilute succinylcholine were used, in addition to the single rapid injection Succinylcholine was used as Sucostrin or Anectine

A major difficulty in devising and interpreting this study was the very nature of the pain under consideration Postoperative pain may result from many causes Pain from the surgery itself, pain from position on the operating table, and pain from other causes, such as traumatic intubation, must be evaluated It was recognized that these sources of pain might be confused with muscle pain Further, the need to eliminate suggestion as a factor in the pain was recognized Therefore, certain reservations were made in the reporting of the postoperative subjective symptoms of pain

Pain in the area of operation was considered to be the result of the surgery, not unexpected, and not related to anesthesia All pain in an area removed from the surgery was suspect of being related to the anesthesia Headache and sore throat were noted, but unless accompanied by other pain were not tabulated as related to the muscle relaxant With two exceptions, all other pain symptoms were considered possibly related to the anesthesia, and were so tabulated for this study One patient with chest pain was found to have pneumonia, and was removed from the suspect group Another patient complained of abdominal discomfort associated with ileus and abdominal distention He too was removed from the suspect group

To be significant, all subjective symptoms had to be volunteered by the patient Only general questions were asked 'How do you feel?" "Are you comfortable?" "Do you have any discomfort? If so, where?' were the sort of inquiries made Suggestions as to site and type of pain were studiously avoided

Other sources of complaints of pain were examined, such as nurses notes and the physicians' progress notes Observations were made of the patients for visual evidence of pain Limitation of movement, reaction to cough, and ease of turning and sitting were evaluated This evaluation proved to be of negligible value, except to confirm symptomatic complaints, because of the limitations produced by the surgery

The day that the patient became ambulatory was also recorded for evaluation

TABLE 1 —Summary of Factors from Patients Reporting Pain Which Might Incriminate Anesthetic Given*

Patient No	Succinylcholine		Fasciculation	Operation	Day of Ambulation	Type and Location of Pain
	Induction	Maintenance				
1	40	0	Yes	Urethroplasty	1st	Aching all over beginning on first p o day Cleared by p o 3
2	30	0	Yes	Sympathectomy	2nd	Aches and pains in shoulders arms legs and back improved p o 3 gone p o 5
3	40	0	Yes	Tubal ligation	2nd	Muscle ache in anus and legs p o 1 gone p o 3
4	40	150	Yes	Bowel decompression	1st	Aching all over beginning p o 2 felt like all muscles were contracting gone p o 3
5	40	0	Yes	Inguinal herniorrhaphy	1st	Pain in thighs and anus p o 3 cleared by p o 5
6	30	0	No	Extraction of lens	2nd	Mild left lower chest pain gone p o 3
7	50	0	Yes	Vaginal hysterectomy	3rd	Sore throat and deep abdominal pain cleared p o 3
8	40	0	Yes	Spinal fusion	Not by 5th	Nurses notes indicated that patient complained of muscle aches all over on the 1st p o day did not complain to examining physician
9	40	0	Yes	Laminectomy	2nd	Pain in shoulders gone p o 3
10	40	0	Yes	Perineal repair	1st	Ache all over patient suggested that the pain felt like after riding a horse better p o 3
11	80	0	Yes	Lumbar laminectomy	2nd	Painful quivering ten eness in legs none in arms trunk or neck gone by p o 3
12	30	0	Unknown	Cholecystectomy	1st	Backache across shoulders on p o 1 gone by p o 3
13	30	0	Yes	Excision of tumor on face	1st	Pain in both flanks patient felt like he was being pulled apart better p o 3
14	20	20	Unknown	Eye sling	1st	Sore stomach chest and shoulders gone p o 3
15	30	0	Unknown	Rhizotomy	2nd	Aches in back arms and abdomen gone p o 3
16	40	0	Unknown	Tympanoplasty	1st	Soreness of abdominal muscles only
17	100	0	Yes	Parotidectomy	1st	Abdominal pain and soreness p o 1 gone p o 3
18	100	0	Unknown	Synechiectomy	1st	Pain in abdomen and flanks gone p o 3
19	100	0	No	Cesarean section	1st	Sore and cramping in shoulders back hips and legs better p o 3
20	100	0	Yes	Excision of Ca on face	1st	Muscle soreness in arms legs and chest p o 1 gone p o 3
21	100	0	Yes	Craniotomy	1st	Sore all over—arms legs abdomen better p o 3 gone p o 5
22	100	0	Yes	Excision of submental triangle	1st	Sore all over gone p o 3

*Cases 1 to 9 were seen known case 10 and 11 were seen known and blind cases 12 to 16 were seen blind and cases 17 to 22 were given 100 mg

Results

Factors from all patients reporting pain which might incriminate the anesthetic drugs are summarized in Table 1 Some patients complaints might be explained on the basis of other factors Patient 7 had endotracheal anesthesia for her vaginal hysterectomy, and the sore throat with deep abdominal pain may have been the result of the surgery and the laryngoscopy Patient 16 had considerable postoperative vomiting, which may have produced the sore abdominal muscles. Patient 11 may have had referred leg pain originating from the laminectomy site. However, such questionable cases were included in the series because the succinylcholine could not be exonerated.

Table 2 summarizes the findings in each of the groups observed. The differences in incidence of pain in each of the three succinylcholine groups ("blind," "known," and "100 mg.") were tested by the chi-square method, and no statistical significance was found ($p > 0.3$).

Therefore, all patients given succinylcholine were compared with patients evaluated "blind" but not given succinylcholine. There was a definitely higher incidence of muscle pain after succinylcholine ($p < 0.01$) compared with patients not given succinylcholine.

Fifty-five per cent of the patients in this study were ambulatory within the first 24 hours after surgery. An additional 15% were ambulatory in the second 24-hour period. Fourteen of the 22 patients with muscle pain were ambulated within 24 hours. The time of ambulation was not statistically different in the group with pain compared to the entire series ($p > 0.2$).

TABLE 2.—Incidence of Postoperative Muscle Pain

Anesthesia, Type	Total Cases	% with Pain
Succinylcholine "blind"	93	7.5
Succinylcholine "known"	246	4.5
Succinylcholine "100 mg."	70	7.1
Inhalation only "blind"	88	0
Regional only "blind"	85	0

Comparison by sex showed that 9 males and 13 females complained of muscle pain.

Comment

The marked difference in incidence of muscle pain in this series and in reports by others is striking. We found the overall incidence of muscle pain after succinylcholine to be about 6% in hospitalized patients. The 36% incidence Morris and Dunn[4] found before their patients left the hospital, and the 90% incidence cited by Mayrhofer[3] were also in hospitalized patients.

Churchill-Davidson[1] implied that early ambulation may have been a factor in the muscle pain in his hospitalized patients. Our data do not support the contention that early ambulation is associated with a higher incidence of muscle pain.

Differences in dosages of succinylcholine were considered as a possible factor in the incidences of pain. Fifty to 100 mg. doses of succinylcholine are frequently used elsewhere, while we commonly find 20 to 40 mg. sufficient. Therefore the "100 mg." series was undertaken. The incidence of muscle pain was not different using the larger dose.

Mayrhofer[3] suggested that hypoxia might be a factor predisposing to muscle pain. He associated muscle pain with lactic acid accumulation, and lactic acid is known to rise during hypoxia. It is interesting that his extremely high incidence of muscle pain, 90%, was found after bronchoscopy, a procedure difficult to accomplish without some hypoxia. Hypoxia was avoided in all our patients insofar as humanly possible, and there were no cases in which bronchoscopy was performed. Perhaps the lack of hypoxia in our patients accounts for the low incidence of pain. If so, this is another reason for keeping a patient well oxygenated.

We were not impressed with the fact that the muscle pain was particularly incapacitating. Patient 10 referred to in Table 1 was uncomfortably sore, and said she would prefer not to move, but managed to bathe herself without incident. Patient 19 moved slowly because of the muscle pain, but was up and about the ward. These two cases were the worst we observed. The other patients were not incapacitated, and for the most part showed little concern for their muscle pain.

Of our patients with muscle pain there were 9 males (3.7%) and 13 females (4.2%). There was no sex difference noted in our series ($p=0.5$).

This study indicates that muscle pain can be a complication in the use of succinylcholine. The possibility of postoperative muscle pain must be considered whenever succinylcholine is used. In our practice, however, the incidence of this pain was low, and, the pain, when present, was not severe or incapacitating. Therefore, there is no objection to the continued use of the drug in hospital practice. Since our practice involved hospitalized patients almost exclusively, we cannot comment on the administration of succinylcholine to outpatients.

Summary

The incidence of muscle pain after administration of succinylcholine was investigated, and found to be about 6%. This incidence was not changed when larger doses were administered. No muscle pain was observed in a series of patients anesthetized without succinylcholine. When present, the muscle pain was usually mild, and at its worst was not incapacitating. The cause remains an enigma, and there is no explanation for the lower incidence in this series than in studies reported by others.

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Factors Influencing the Ratio of Uterine Cancer in a Community

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The ratio of the number of cases of cervical cancer to endometrial cancer was found to be 6 7/1 in one hospital, while at another hospital in the same city, but a few miles away, the ratio was 1 1/1 The incidences of cervical carcinoma in situ were also unequal The populations from which the two hospitals received patients differed significantly in ethnic composition and economic status The members of the two staffs also differed in interests and methods Since these factors clearly influenced the figures it is evident that statistics of this kind need careful scrutiny before any observed differences can be interpreted as resulting from treatment or indicating a trend

PAST statistics have invariably indicated that epidermoid cancer of the cervix is more common than adenocarcinoma of the endometrium by a ratio of approximately 6/1 or 8/1, and this incidence is quoted in all but the newest editions of gynecological textbooks A recent publication by Webb, Traut, and Margolis[1] notes a gradually increasing frequency of corpus cancer, so that the present ratio at their San Francisco clinic finds cervical cancer only three times as common as the endometrial variety A similar article by Tweeddale and others[2] indicates that at the Lincoln General Hospital in Nebraska the incidence of fundal cancer actually exceeds that of cervical disease, for over a 12-year span they have had 144 patients with fundal and 95 patients with cervical carcinoma, a ratio of approximately 3/2 From this and many other sources it would appear that the changing ratio is not so much due to a lowered incidence of epidermoid cancer as it is to an increased occurrence or recognition of fundal adenocarcinoma In indicating an almost equal ratio of cervical and corpus cancer in New York, Haenszel and Hillhouse[3] point out an extremely low incidence of cervical carcinoma in patients over 50 years of age as well as a wide variation among racial and ethnic groups not observed in adenocarcinoma malignancy

Increased Incidence of Cervical and Endometrial Cancer

One might well wonder if improved obstetrical care of the postpartum cervix with frequent immediate repair and later prophylactic cauterization might not initiate a trend toward a decreased incidence of cervical disease and subsequent malignancy While this may be true, at the same time increased and almost routine use of the cytological smear and biopsy specimens in some clinics has brought about a marked increase in reported cases of early carcinoma of the cervix Thus there is a higher percentage of earlier cases presenting for treatment with a resultant more favorable five-year salvage, now 37% for all cases, it was 31% earlier[4] In any event, there is no apparent decrease in the total number of cervical cancer, as near as can be detected by vital statistics, although most clinics report a lesser incidence of advanced cases of international classification (IC) stage 3 and 4

We should like to point out, however, the considerable difficulty in actually assessing the incidence of cervical or endometrial cancer in a community Although most clinics report these diseases as separate entities, the majority of state and national statistics have usually included them jointly as cancer of the uterus Thus it has not always been possible to be certain of the percentage incidence among all women, and most comparative figures have accrued from clinic material composed of patients with some type of specific uterine disease As hospital patients these are not necessarily comparable to the population at large

There have been a number of suggestions as to why there appears to be a greater increase in cases of endometrial adenocarcinoma, and it would seem that all of the factors suggested may play a role,

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Read before the Section on Obstetrics and Gynecology at the 109th Annual Meeting of the American Medical Association Miami Beach June 14 1960 although no one is completely explanatory Perhaps the most championed claim is a simple statement of the increased longevity of the present American women This would of course permit additional women to reach the postmenopausal era, during which years fundal cancer is particularly prone to make its appearance Since cervical carcinoma commonly affects the woman about a full decade younger, one would not expect a proportionately great increase of this type of tumor If the peak incidence of cervical cancer were in women 47 years old and if the female life span were only 50 years, most of those destined to suffer from cervical cancer would already have contracted the disease, if the life span is increased to 68, there is apt to be a disproportionate increase in the characteristically postmenopausal (average age of patients about 57 years) endometrial adenocarcinoma The mere laws of probability would seem to suggest that longevity would tend to increase the frequency of endometrial carcinoma

The markedly increased and sometimes rather indiscriminate use of estrogens has also been suggested as playing some role in the more frequent occurrence of corpus cancer Evidence of this is suggested by a considerable number of cases of adenocarcinoma which have evolved during or after protracted estrogen therapy There is much support for this doctrine of "estrogen stimulation," as was noted fully by Novak, but it may only be summarized here Evidence includes (a) the frequent association of granulosa-theca cell (estrogen-secreting) tumors with adenocarcinoma, (b) the comparative rarity of fundal cancer in the castrate female, (c) the frequency of endometrial cancer preceded by hyperplasia or their coassociation in the same microscopic fields, (d) the production of adenocarcinoma by estrogens in rabbits as noted by Meissner and others[7], (f) the occurrence of histological pictures indistinguishable from genuine cancer with all intermediate transition forms which have been produced in humans by exogenous estrogens, and (g) the similar clinical and physical features found in patients with postmenopausal hyperplasia and adenocarcinoma as indicated by one of us (E R N)[5] [6] and more recently confirmed by Garnet[8]

Despite this multitude of suggestive factors, admittedly no one is conclusive, and there are a few authors, such as Larson,[9] Greene and others,[10] and Emge,[11] who dispute the so-called "estrogen theory" Emge, while denying that estrogen is a direct factor, does agree that there are many confused histological patterns of adenomatous hyperplasia that may result from protracted estrogen treatment These atypical proliferative forms may exist spontaneously or result from exogenous steroids, and their meaning and subsequent behavior has excited much curiosity in the last decade It is apparent that there is no sharp line of demarcation between the appearance of certain proliferative forms of hyperplasia and early adenocarcinoma, and there is considerable difference of interpretation as to what is atypical and benign or low-grade malignant There are many excellent pathologists who consider markedly atypical hyperplasia (our designation) as adenocarcinoma in situ (Hertig and Sommers[12]) and, while we dislike this term, there is no doubt that sometimes this lesion progresses into true cancer It is our own opinion that only a minority of women whose endometria exhibit this pattern develop subsequent malignancy, although we concur in the desirability of hysterectomy where there is recurrent proliferative hyperplasia

Misinterpretation of Endometrium

The quest for recognizing the earliest forms of endometrial abnormalities has resulted in overzealous enthusiasm and many premature diagnoses In dealing with intraepithelial cervical cancer, most authorities insist that there be complete full thickness replacement of the stratified squamous epithelium by abnormal undifferentiated cells, generally basal Only if strict definitions are adhered to will it be possible to avoid premature treatment of such frequently reversible histological patterns as basal cell hyperactivity and atypical epithelium It is regrettable that there are no such rigid criteria for a diagnosis of early endometrial cancer As a possible sequence we have seen many sections referred from other clinics erroneously interpreted as "adenocarcinoma in situ" and treated by irradiation or hysterectomy or both A number of these showed merely typical cystic hyperplasia with minimal proliferative tendencies, and not a few showed normal progestational changes Although the latter may sound inexcusable, separate publications by McKay[13] and Wall[14] suggest that atypical hyperplasia may manifest a secretory function of the glandular lining epithelium not unlike the normal progestational phase of the cycle, and there are certain other similar histological patterns that may lead to honest confusion

As a consequence of this misinterpretation of normal or only mildly proliferative epithelium, a mistaken diagnosis of endometrial adenocarcinoma is made with considerable frequency, if we may judge from referred "outside specimens" For reasons indicated earlier in this paper, we feel that a misdiagnosis occurs much more frequently with endometrial than cervical tissue Thus one would expect to see a more abrupt rise in the number of reported cases of so-called fundal adenocarcinoma

Influence of Extrinsic Factors on the Cervix

Of obvious importance in any given series is the selection of material, and many environmental, ethnic, and sociologic factors may greatly influence the incidence of any disease Most reports emphasize the etiological importance of coital and puerperal trauma and subsequent infection of the cervix Rewell[15] reports that in India, where the average for marriage and subsequent pregnancy is 15 years of age, carcinoma of the cervix occurs a full decade earlier than in the United States Gagnon[16] has indicated the extreme rarity of cervical cancer among nuns, and the relative paucity of this disease among Jewish women is an established fact Wynder[17] has summarized such factors as racial predisposition, smegma and degree of circumcision, frequency of intercourse, first pregnancy and number of births, contraception, and effects of abstinence and has concluded that a number of these may be of importance, although he suggests that carcinogenesis is probably the result of many incalculable factors, both exogenous and endogenous Irrespective of the cause, cervical cancer is only about one-eighth as common among Jewish females There is extensive publication on racial and other sociologic and etiologic facets of this disease

Endometrial cancer is likewise attended by a multitude of extrinsic factors For example it is repeatedly noted to be most common in the white, private patient Its frequent association with such conditions as diabetes mellitus, hypertension, obesity, nulliparity, or poor fertility index have been the subject of repeated discussion Obviously, then, a report from a large southern clinic with a high percentage of indigent negroid patients should not be evaluated in the same light as material from a northern private hospital This geographical selection of cases must always be considered, but selectivity within the same locale is likewise an important determining factor

Comparative Figures of Different Hospitals

To simply illustrate our point, it seemed of interest to critically analyze the cases of uterine cancer that have occurred at several typical Baltimore hospitals Until a recent addition doubled the census, the Bon Secours Hospital (BSH) had about 200 beds, of which about one-half were generally occupied by gynecological patients While it is a Catholic hospital, patients of every creed are represented, but there have never been facilities for Negroes

In contrast to the BSH material are cases from the Johns Hopkins Hospital (JHH), which accommodates approximately 1000 patients, although only about the same number of beds are gynecological as at BSH, namely 100 Although located only a few miles or minutes from BSH, there is a vast difference in the patient clientele A large public ward personnel occupies approximately one-half of the JHH beds, and 80% of these ward patients are Negroes In addition, there are many cases referred from all over Maryland and the Mid-Atlantic states to its dispensary and radium clinic

In the 11-year period, 1940 to 1950, Pentecost and Brack noted a total of 885 cases of uterine cancer, of which 770 were cervical in origin If 103 cases of IC stage 0 are excluded, the number is 667 During this period there were 115 cases of adenocarcinoma of the endometrium The ratio is thus 5 8 cases of clinical carcinoma of the cervix to 1 case of endometrial cancer, or 6 7 to 1 if the stage 0 cases are included (see table) Of the patients with endometrial cancer 45% were ward patients and 55% private, 70% were white and 30% negroid patients Approximately the opposite ratio was apparent in women afflicted with a cervical malignancy

In the same period of time at BSH, with about the same number of beds in use, there were only 183 cases of uterine cancer, of which 100 had originated in the cervix, including 7 cases of IC stage 0 Three cases of primary cervical adenocarcinoma were present, but all the rest were epidermoid, including three stump lesions There were 83 cases of endometrial cancer with a resultant ratio of 1/1 2 to all cases of cervical cancer or 1/1 1 if in situ lesions are excluded In other words, the diseases nearly approximated each other

Although no formal study was made at the neighboring Sinai Hospital, we felt a tabulation of their material in the same 11-year span might be of interest Although the Sinai Hospital is a Jewish institution of 275 beds, only about 50% of their patients are non-Gentile, and it is difficult to be certain of the number practicing orthodox habits Because of the presence of an excellent Kosher kitchen, it would probably have a particular appeal to the orthodox patient, while the nonorthodox Hebrew would probably not care where he was hospitalized Relatively few negroid patients are admitted

Data on Uterine Cancer in Three Baltimore Hospitals, 1940 1950

	Hospitals		
	Johns Hopkins	Bon Secours	Sinai
Uterine Cancer			
Cervix (all cases) no of patients	770	100	127
Endometrium no of patients	115	83	88
Total	885	183	215
Incidence cancer of cervix/cancer of endometrium			
All cases	6 8/1	1 2/1	1 5/1
Excluding IC stage 0 cases	5 7/1	1 1/1	

Through the courtesy of the respective chiefs of gynecology and pathology, Drs Adler Sondheimer and Tobias Weinberg, the following figures have been made available to us Between 1940 and 1950, Sinai had 127 patients with cervical cancer (including an undetermined number with intraepithelial cancer) and 88 with endometrial cancer, a ratio of 1 5/1 In the last five years, however, cervical cancer was twice as common as endometrial cancer, prior to this the ratio was almost even Whether this is a significant trend, we do not know, if it is, it would bear out Dr Sondheimer s clinical observation that he is seeing more cases of cervical cancer among Jewish women

Thus, we find that in three nearby hospitals in Baltimore the relative frequency of cervical to endometrial cancer is 6.7/1, 1.2/1, and 1.5/1 (all cases), and this single point might serve to simply emphasize the importance of properly evaluating statistics from representative clinics. Actually the figures at BSH were almost in accord with those of Tweeddale,[2] whose report covered the years 1940 to 1952. It is interesting to note that Tweeddale states that his "percentage of nonwhite and Jewish in this area is relatively low," and actually there were only two known negroid patients. It may not be merely speculative to suggest that the material from BSH, Baltimore, is more similar to the Lincoln General Hospital in Lincoln, Neb., than it is to JHH, which is also in Baltimore.

A recent article by Rewell[15] has dealt with a comparative study of uterine carcinoma in England and South India. He notes as follows: "Thus in hospital practice in England endometrial and cervical carcinoma are approximately equal in incidence. Rules laid down for England are, however, of little use in India, where carcinoma of the body of the uterus is very much less frequent than of the cervix." Endometrial cancer in India is regarded as such a rare disease that "reports of single cases are worthy of publication in technical journals." Again we may speculate that South Indian patients represent merely an exaggerated degree of southeast Baltimore patients (JHH), while southwest Baltimore women (BSH) fashion their diseases after London (or Lincoln) patterns.

Intraepithelial Carcinoma

We would likewise point out a considerable difference in the ratio of intraepithelial and invasive cancer as found in the two clinics. At JHH cancer in situ comprised 103 of 770 cases, or 14%, at BSH only 7 of 100 (7%) carcinomas were noted as preinvasive. There are several reasons for this disparity between the two institutions.

Carcinoma in situ is a microscopic entity only, appearing in the absence of a gross lesion. We have always suspected that various stimuli such as hormonal imbalance and infection, the latter particularly common in the Negro race, might produce microscopic patterns in the cervix identical with preinvasive cancer. We have felt that, if the stimulus is withdrawn in time, the histological pattern may regress to essential normalcy. Actually we have witnessed this sequel occasionally in patients with long-standing inflammatory disease, in whom a histologically hyperactive cervix become normal after antibiotic and local therapy. This is more fully discussed in a previous publication by Novak and Galvin.[18]

Patients whose cervix show a pattern compatible with carcinoma in situ are properly treated by hysterectomy, which obviously terminates any further evaluation of cervical cellular morphology. Although unquestionably many of these intraepithelial cancers would progress to true invasive cancer, who can state dogmatically how many patients would have become well had hysterectomy not been performed? Thus it would seem probable that the Negro race, more prone to inflammatory disease, might show a higher proportion of cervical atypia and a higher ratio of intraepithelial to invasive cancer. Inflammatory disease and poor cervical hygiene is perhaps less common in the white race, and there is the relative infrequency of irritative stimuli that might produce bizarre, if evanescent, alterations in the stratified squamous epithelium.

We have always stressed caution in establishing a diagnosis of intraepithelial cancer in general and especially in the course of pregnancy. It is well established that pregnancy can produce marked degrees of cervical atypia which regress to normal when the pregnancy is terminated. It is now accepted by most gynecologists, however, that when a full-fledged unequivocal carcinoma in situ occurs *during gestation it should be regarded as in exactly* the same light as it would be in nonpregnant patients. In other words, the pregnancy is merely incidental, not instrumental. However, if invasion is safely excluded, treatment can generally be deferred until after termination of the pregnancy.

Unquestionably the prime cause for a higher ratio of carcinoma in situ at JHH was the intense interest and search for this disease by the staff. Much of the important investigative work pertaining to the validity of intraepithelial cancer was performed at Hopkins in the forties, and there was a resultant early "liberal biopsy policy," which had not as yet extended to all clinics. Actually it is surprising to find that, during a full decade, the diagnosis was made only on seven occasions at BSH. Currently increased and almost routine use of cytology with supplementary biopsy have resulted in the detection of many more cases at this and, indeed, at all other institutions.

In none of the clinics studied have we made any particular attempt to compute salvage in this report. Our only interest has been to indicate how the factor of hospital selection may influence statistics honestly arrived at. It would behoove the teacher to always evaluate statistics lest he innocently perpetuate misconceptions to his students. Certainly it seems obvious that the incidence and relative ratio of certain important gynecological diseases is subject to a multitude of environmental variants, and studious consideration of these should precede any hasty conclusions.

Summary

Although cervical cancer had always been considered six or eight times more frequent than endometrial adenocarcinoma, recent reports have indicated their occurrence in an approximately equal ratio The selection of patients must be considered among the important causes of this change in proportions

Comparative study of cases of uterine cancer was carried out at three adjacent Baltimore hospitals, and the ratios of cervical to endometrial cancer were found to be 6 7/1, 1 2/1, and 1 5/1 respectively This discrepancy seems to be due to the material incorporated into the study

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THE CALCIFIED HILAR NODE—Seldom in medicine has such an easily identifiable and potentially destructive lesion as the calcified hilar lymph node been given so benign a designation The roentgenographic detection of hilar node calcification has received little consideration other than to suggest that a healed inflammatory process has become safely incarcerated True, the calcific focus is chemically inert and, for the most part, incapable of stimulating further tissue reaction It is, however, the force vitale represented by a sharp, hard mass in contact with delicate moving intrathoracic structures which gives significance to the calcified hilar node Irrespective of initial cause, the phenomena which may transpire depend upon the anatomic location of the calcified nodes Nodes in contact with a bronchus may gradually erode its wall In other instances the node may compress the bronchus and produce atelectasis Traction diverticulum of the esophagus and compression of the superior vena cava are the remaining possible manifestations The clinical picture with each lesion is clearly recognizable and in most cases can be satisfactorily managed The patient with hilar node calcification should be studied with respect to the possible related clinical manifestations A chronic cough or dysphagia should not be lightly regarded Either of these symptoms may be due to calcified nodes Special studies such as bronchography or laminagraphy may demonstrate the anatomic relation of node and bronchus, esophagus or vena cava A high degree of awareness must be maintained in order that effective therapy be instituted The tendency in the past has been to overlook the pathogenic possibilities of calcified hilar nodes This attitude is not justified by fact As in many situations early aggressive treatment will often preclude the development of the disastrous complications which are so often the result of prolonged conservative management—J Storer, and R C Smith The Calcified Hilar Node Its Significance and Management *The American Review of Respiratory Diseases,* June, 1960

Crushed Chest and the Anesthesiologist

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Crushing injuries of the chest, notably with associated trauma of other parts of the body, require careful evaluation prior to anesthesia Accordingly, roentgenograms should be obtained in suspected cases of pneumothorax, constant monitoring of breath sounds is essential With blood loss there should be adequate replacement to stabilize the cardiovascular system Positive pressure breathing may be helpful pending definitive care of the unstable thoracic wall Endotracheal intubation in general anesthesia is a necessity to protect the lungs from aspiration of gastric contents and to improve the patient's respiratory exchange Continuous epidural analgesia is valuable for the relief of pain, providing there is no evidence of other serious injury It is emphasized that severely injured patients require minimum preoperative medication

IF NOT FATAL at the time of occurrence, blunt compressing trauma to the thorax and its contents presents a definite hazard to the patient's survival The resultant unstable thorax plus the frequently associated trauma to the underlying lung produce serious disturbance in the patient's respiratory function Although disturbance of respiratory function is the cardinal finding in these patients, occasionally a significant injury also has been sustained by the heart and great vessels Furthermore, this type of injury, when it occurs after automobile accidents, is more often fatal or nearly fatal than all other types of injuries[1] When it is realized that a majority of these injuries are the outcome of automobile accidents, the significance of this type of injury can be appreciated by the anesthesiologist, since other injuries may be present which require surgical intervention

About 1 5% of individuals injured in automobile accidents suffer a crushed chest[1], the frequency, therefore, with which one anesthesiologist may encounter this injury is low Nonetheless, certain aspects of this type of injury are such that anesthesia must be administered to these patients with extreme caution This report presents by means of typical case histories the problems which may be encountered in the anesthetic management of these patients Also, epidural analgesia in the management of pain in these patients is discussed

General Considerations

The two organ systems of utmost concern to the anesthesiologist, the cardiovascular and respiratory, are involved in these patients Various authors have commented on the amount of blood loss in the patient with multiple injuries[2-4] In an analysis of the patients admitted to this hospital primarily because of chest injuries, 25% required four or more units of blood to maintain a stable blood pressure Therefore, an adequate quantity of blood should be readily available for these patients

Simultaneously with the maintenance of an adequate circulating blood volume, attention has to be directed toward obtaining an adequate respiratory exchange The methods of stabilizing the thoracic wall fall within the surgical care of these patients, however, the anesthesiologist may be of assistance in performing positive pressure breathing while the definitive care of the unstable thoracic wall is accomplished

The anesthetic agents and techniques to be used in these patients will vary with the individual anesthesiologist, there being no one agent or technique better than the next However, it should be remembered that the severely injured patient requires less preoperative medication and less anesthetic agent to maintain satisfactory operative conditions Whenever possible, conduction anesthesia should be used, however, spinal anesthesia is not indicated in patients who might have an unstable cardiovascular system as a result of trauma If general anesthesia is used, endotracheal intubation is a necessity to protect the lungs from aspirated gastric contents, as well as to improve the patient's respiratory exchange

Report of Cases

Case 1 (Epidural Analgesia) —A 49-year-old woman sustained fractures of ribs 2 through 9 on the right and 1 through 10 on the left as a result of an automobile accident

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Read before the Section on Anesthesiology at the 109th Annual Meeting of the American Medical Association Miami Beach June 14, 1960

All fractures were located along the middle axillary line The resultant paradoxical movement of the anterior chest wall was associated with a great deal of pain In addition, there were bilateral minimal pneumothoraces as well as clouding of the left lung field, suggesting a traumatic pneumonitis

Except for multiple small abrasions and contusions over the body, no other significant injury was present A short interval of unconsciousness followed the accident, and the patient was observed closely for signs of intracranial injury Vital signs were blood pressure 120/80 mm Hg, pulse rate, 120 per minute and respirations 40 per minute

Immediate therapy was directed toward relieving the bilateral pneumothorax so that progression to a tension pneumothorax would be avoided and the area of functioning pulmonary tissue increased This was accomplished by placing bilateral thoracotomy tubes in the second anterior interspace and giving positive pressure oxygen to expand the lungs This therapy corrected the bilateral pneumothorax

Other immediate problems were relieving the patient s severe pain, associated with respiration and improving her respiratory exchange Continuous epidural analgesia was selected as the method of relieving her chest pain, and it was decided that the chest wall would be stabilized by skeletal traction if necessary

Placement of the plastic catheter for epidural analgesia was accomplished by inserting a 16-gauge Touhy needle between the thoracic spinous processes of 4 and 5 Through this catheter 10 cc of 1% procaine solution was injected An area of hypesthesia was established between thoracic dermatomes 2 and 8 After the injection of procaine there was considerable relief of pain and the vital capacity previously 400 cc, increased to 1000 cc Respiratory rate slowly dropped to 24 per minute The catheter was connected to a continuous drip of 0 1% procaine solution, the rate of which was adjusted to deliver 10 cc of the solution every 30 minutes The catheter was left in place for six days at which time it was removed, and the patient remained pain-free thereafter

Comment—Ineffective respiratory exchange resulting from the unstable thoracic cage is the major problem in the patient sustaining a crushed chest, however, the accompanying severe pain further hinders the patient s ability to produce an adequate respiratory exchange Continuous epidural analgesia, therefore, presents a method of pain relief in these patients If adequate respiratory exchange is not obtained after epidural analgesia, then other recommended forms of therapy for treating the unstable thoracic cage and increasing respiratory exchange may be instituted or combined with the epidural analgesia [5, 6, 7]

The question may be raised whether epidural anesthesia in the thoracic region may paralyze the intercostal muscle Bromage states that one advantage of epidural analgesia is that full spontaneous respirations are maintained [8] We verified this statement by measuring the tidal volume and vital capacity in three patients undergoing abdominal surgical procedures Epidural anesthesia was established in these patients to the second thoracic dermatome with 2% lidocaine solution, after which no significant change occurred in tidal volume or vital capacity (see table)

There are limitations to the use of epidural analgesia for this type of injury, such as in the patient suffering concomitant abdominal injury in which epidural analgesia may mask the signs of intra-abdominal injury Patients in shock or suffering from head injuries should not receive this form of pain relief

CASE 2 (*Tension Pneumothorax*) —A 47-year-old man was admitted to the emergency room after an automobile accident He had a large laceration over the right temporal parietal region and was disoriented Admitting vital signs were blood pressure, 60/0 mm Hg, pulse rate, 140 per minute, and respirations, 30 per minute In addition to the laceration there was a large hematoma over the right anterior chest wall with some subcutaneous crepitation Radiographic examination of the skull and thorax on admission demonstrated a right temporal and basilar skull fracture and fractures of ribs 4 through 9 on the right side and 4 and 5 on the left, with no evidence of pneumothorax After two units of whole blood were administered, the patient s blood pressure became stable at 110/80 mm Hg, he had a pulse rate of 100 per minute However, his level of consciousness rapidly became more depressed, indicating the possibility of either epidural or subdural hematoma Shortly after admission to the emergency room, he was taken to surgery Preoperative medication was limited to administration of atropine sulfate, 0 3 mg intramuscularly

On his arrival in the operating room, the blood pressure was 110/80 mm Hg, pulse rate 100 per minute, and respirations 30 per minute Induction of anesthesia with 100 mg of thiopental given intravenously was well tolerated Endotracheal intubation was performed after the patient received 20 mg of succinylcholine chloride intravenously Spontaneous respirations returned within one minute after the succinylcholine was administered, and anesthesia was maintained by the intermittent intravenous administration of 2 5% thiopental solution plus nitrous oxide (2 liters per minute) and oxygen (1 liter per minute)

Tidal Volume and Vital Capacity Before and After Induction of Epidural Anesthesia to the Second Thoracic *Dermatome in Three Patients Undergoing Abdominal* Surgery

Patient No	Tidal Volume cc		Vital Capacity cc	
	Before	After	Before	After
1	300	300	3200	3000
2	450	400	4500	4400
3	400	400	4300	4300

The surgical procedure of bilateral multiple trephinations of the skull was begun approximately 10 minutes after intubation During this period the patient s vital signs remained at their preoperative values However, shortly thereafter respirations increased to 40 per minute and pulse rate to 140 per minute, and blood pressure dropped to 70/40 mm Hg Concomitant with these changes the anesthesiologist noticed that an increased amount of pressure on the breathing bag was required to ventilate the patient This he interpreted as a sign of bronchospasm, treating it with a mixture of helium and oxygen Within two minutes of this time the blood pressure and pulse disappeared and respirations ceased, and a diagnosis of cardiac standstill was made

The thorax was opened immediately through the fourth anterior interspace, and the mediastinum was noticed to be markedly shifted to the left The heart was asystolic At this time a diagnosis of tension pneumothorax on the right was diagnosed and treated by catheter drainage to an underwater seal Artificial circulation by manually compressing the heart was instituted at the time the thorax was opened, and after five minutes of this treatment an effective cardiac contraction, producing a blood pressure of 90/60 mm Hg with a pulse rate of 110 per minute, was obtained

During the closure of the chest wall, the original neurosurgical procedure was completed with findings of massive bilateral subdural hematoma and small epidural hematomas The patient never regained consciousness, and he died 12 hours postoperatively

Comment—As mentioned previously, very few patients enter the hospital with injuries limited only to their chest Two-thirds of the patients receiving injuries resulting from automobile accidents will have injuries in more than one area of the body[1] The possible hazard associated with giving anesthesia to the patient with multiple injuries is presented in the above case report Although this patient had a fatal type of head injury, the insult produced by circulatory arrest could have produced a fatal outcome in a patient with a minor type of head injury Of equal importance is that the same sequence of events could have occurred in a patient with a compound fracture of femur or other nonfatal type of injury requiring immediate surgical intervention

How, then, can the production of a tension pneumothorax after a crushing injury to the chest be avoided in a patient requiring general anesthesia? Obviously, roentgenograms of the chest should be taken in all patients sustaining an injury to the chest If, on the preliminary films, evidence of pneumothorax is obtained, this should be treated by catheter drainage to an underwater seal before general anesthesia is induced

If only fractured ribs are present without evidence of pneumothorax, then the anesthesiologist has to be extremely careful in the management of these patients and undue pressure on the breathing bag should be avoided If an increasing amount of pressure is required to inflate the chest, this should call attention to the possibility of a tension pneumothorax In addition to observation to detect this fairly unreliable sign, frequent or even continuous auscultation of the chest should be carried out Any suspicion of a pneumothorax should be confirmed by needle aspiration This aspiration, performed in the second anterior innerspace, should be treated by catheter drainage to an underwater seal if it shows positive findings

Another cause of pneumothorax, not related to injury of the pulmonary parenchyma, is a laceration of the trachea or major bronchi This type of injury is associated usually with massive and rapidly progressing subcutaneous emphysema and pneumothorax Emergency treatment under these conditions should consist of immediate bronchoscopy to identify the location of the laceration and intubation with a cuffed endotracheal tube beyond the area of laceration or of the uninvolved bronchus Definitive surgical repair of the laceration should then be accomplished

Injury to Other Thoracic Structures

The heart, aorta, and pulmonary vessels may be injured by a blunt compressing injury to the thorax When these structures are involved, the anesthesiologist must be prepared to administer a large quantity of blood in a short interval of time A minimum of two intravenous infusions through 13 gauge needles is required in these patients If there is electrocardiographic evidence of myocardial contusion, surgical procedure should be delayed if possible This will allow time for accurate assessment of the degree of myocardial insufficiency which might occur as a result of the contusion

Rupture of the diaphragm may produce respiratory insufficiency, particularly if the stomach herniates through the rupture and becomes distended In all cases involving the left diaphragm a nasogastric tube should be inserted

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A **HARVARD MAN**—The really important difference between Harvard men and other men is that the former went to Harvard and the latter did not Like it or not, any entering Harvard freshman is subject to what might be called collegiate predestination It does not matter that every Harvard generation is made up of several thousand individuals The Harvard man is bound to be thought something that he probably is not and that handicap should have some subconscious effect on his writing—W Bentinck-Smith Harvard Book (Selections from Three Centuries) Cambridge, Mass, Harvard University Press, 1953

Preoperative Radiation in Treatment of Breast Carcinoma

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In the period from January 1936, to June, 1942, 40 patients with breast carcinoma were treated with x-ray (250 kv) before, rather than after, operation All were reexamined annually, and in all but four cases contact was maintained until the present time or until death It is now possible to report that 7 (17 5%) of the 40 patients are living 20 years after the diagnosis of breast carcinoma was established The diagnoses were confirmed by biopsy in all but four advanced cases Two case histories given in some detail illustrate the effects of the radiation on the tumor and justify the use of radiation first in order to reduce the danger of disseminating tumor cells during the subsequent surgery It is believed that modern radiologic techniques may overcome former objections to preoperative irradiation and that this plan deserves more extensive trial

DURING a recent review of the cases of breast cancer that have been referred for radiation therapy to the University of Kansas Medical Center, Department of Radiology, since 1930, our attention was called to a group of 40 patients who received preoperative instead of postoperative radiation therapy We were impressed with certain findings in the subsequent pathological reports, notably that the prognosis has proved to be better than the average

Justification of Preoperative Irradiation

In 1938, the late Dr T G Orr, at that time chief of the Department of Surgery of the University of Kansas Medical Center and Professor of Surgery in the University of Kansas Medical School, agreed with me that a variation from the usual method of handling the treatment of breast cancer should be used for a period We were impressed with the fact that the results obtained by radical surgery followed by postoperative radiation therapy, which had been our plan of treatment, were not the best It was decided that a diagnosis by biopsy should be established, when feasible Thereafter, preoperative x-ray therapy was to be given with our available 250 kv x-ray therapy unit We agreed that surgery should be postponed for a period of from six to eight weeks It was our thought that this period of delay would result in the greatest damage to the tumor cells

Forty patients were treated in this manner This series included unselected cases referred by Dr Orr during the period January, 1936, to June, 1942 During World War II, the excess work load thrown on all departments of the Medical School resulted in termination of the program for no good reason In the meantime, Dr Orr died, and the results have not been reported until now

I realize that the number of cases presented here is small As we look back on our experience of almost 30 years in the practice of radiology, we are impressed with the fact that, when cancer of the breast is diagnosed and the patient referred to a surgeon, a feeling of urgency is related to the treatment of the case Particularly, if axillary glands are felt, it seems that the surgeon is impelled to operate immediately as a life-saving procedure Actually, it is difficult for a clinician to decide how long the disease has been present before the patient presents herself for treatment In many, perhaps most, instances this cannot be decided by close questioning of the patient Park and Lees[10] believed, on purely theoretical grounds, that in many cases the tumor had been present for many months, or even years, prior to the onset of symptoms They did not think that delay in surgical treatment affects the five-year survival period These authors also asserted that from 20 to 30% of persons with a diagnosis of breast cancer do not develop axillary metastasis within three years of the onset of the tumor Budd[4] believed that in most patients the tumor, when first detected, is at least 20 mm in diameter

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Everyone must be impressed by the curability of breast cancer as related to the clinical stage, however lacking this may be in precision One may follow Portmann's [11] classification of breast malignancy stages and decide that a case is in Stage I because no axillary glands are found Yet, Saphir and Amromin,[13] by meticulous examination of resected axillary lymph nodes that had been previously diagnosed by routine procedure to be free from cancer, found malignant cells in 30% of the cases Granted that a case in Stage I has a better prognosis than one in Stage II, it is doubtful if one or two months, of x-ray therapy, will be a factor in determining the cure or death of a patient

Dependence on surgery alone in the treatment of mammary cancer is illogical, unless the diseased tissue is completely accessible to surgical removal Handley and Thackray [7] showed in their series that 46% of patients with axillary-node involvement (approximately 60% of the total) will have deposits in the internal mammary chain Andreassen and Dahl-Iverson [1] stated that 33% will have metastasis in the supraclavicular glands Wangensteen [15] maintained that 65% of women with axillary nodes positive for cancer will show internal mammary-gland or supraclavicular-gland involvement with cancer Handley and Thackray [7] found that 11% of patients having no demonstrably positive axillary glands had cancer of the internal mammary chain They found that 60% of inner-quadrant and 10% of outer-quadrant tumors had spread to the anterior mediastinal glands at the time of discovery Those surgeons following the lead of Wangensteen [15] and others have attempted what previously has been considered an illogical and impossible procedure—removal of the supraclavicular and internal mammary glands If we are to judge by the activity of the surgeons with whom we are associated, it is doubtful that this will become a universally accepted procedure

Pros and Cons of Preoperative Irradiation

The possibility of spread of the tumor by the surgeon, no matter how skilled and meticulously careful he may be, is recognized If a lymphatic channel filled with tumor is cut through, the possibility of an embolus being dislodged and carried elsewhere must be considered Recurrence along the scar is considered to be directly related to the implant during surgery It would seem logical to inactivate these cells, if possible, by radiation prior to surgery McWhirter [8] tried to avoid spread by removing the primary lesion by means of simple mastectomy Thereafter, the axillary and supraclavicular areas were treated vigorously with radiation

On perusal of the literature, not much enthusiasm for preoperative radiation therapy is found This, very likely, is due to a lack of experience with this routine of therapy on the part of surgeons and radiologists The case is referred first to the surgeon, who—as he has been taught by his predecessors—finds it convenient to operate immediately A few radiologists, including Ash and associates [2] and Berven,[3] and several surgeons, including Goode and Martin [6] and Nohrman,[9] have presented arguments and data in support of preoperative radiation therapy (in most instances they selected the patient who would receive therapy before operation) Berven [3] suggested that the patient have both preoperative and postoperative irradiation He reported that 32% showed five-year freedom from disease after performance of this procedure These authors stated that radiation appparently kills cancer cells and alters others by producing stromal changes favorable to hibernation These changes are described as avascularity and production of a collagenous base Garland,[5] in his monumental survey of the problem of breast cancer, said of preoperative radiation therapy "As a precursor to some cases of radical mastectomy the program has merit, but as an adjunct to simple mastectomy and postoperative irradiation it is not believed to be indicated" Stein, Castlow, and Meland [14] reported on their experience with preoperative radiation as follows Stage I cancer of the breast five-year survival without cancer, 73%, Stage II cancer of the breast five-year survival without cancer, 31% These patients were operated on from four to six weeks after completion of therapy In discussing the subject of preoperative therapy, these authors stated "The most controversial aspect of the place of radiation therapy in the treatment of breast cancer is the question whether or not it should be given preoperatively or postoperatively There have been too few adequate series of Stage II or Stage III cancers (skin and/or lymph nodes involved) irradiated preoperatively, because of the unwillingness of surgeons to permit the period of delay necessary to carry out this form of therapy It is only after a series of cases has been treated under the same scientific conditions in various parts of the United States that we can make a proper analysis of results"

Even though we can show in our series of forty cases that cancer may be destroyed or seriously damaged by preoperative irradiation, and although the same observation has been made by others, we would not be so presumptuous as to suggest radiation as the sole, or the most important, treatment for breast cancer Ash and associates,[2] after a thorough study, found cancer cells in 75% of the irradiated breasts and in 65% of dissected axillas

Theoretical Value of Preoperative Radiation Therapy in Breast Cancer—The possible benefits listed by Ash and associates [2] are (1) the ability of radiation therapy to destroy the cancer cells in some cases, (2) the effectiveness of postradiation fibrosis in devitalizing the cancer cells through (*a*) preventing local invasion by a wall of fibrosis (*b*) preven ing distant lymphatic embolism by constriction of lymphatics with perilymphatic fibrosis, and (*c*) possibly affecting the cell by diminution of the blood supply, (3) the possibility of a higher tumor dosage and the presence of more tissue to absorb rays, (4) the lower susceptibility of normal tissue to tumor implantation, (5) spread of devitalized cells by operative trauma, (6) the possibility that regression of an inoperable lesion may make surgical treatment possible, and (7) use of preoperative radiation therapy as a second-choice procedure

Theoretical Disadvantages of Preoperative Therapy—The possible disadvantages listed by Ash and associates[2] are (1) increased technical difficulties at the time of operation, due to postoperative fibrosis, (2) adverse effect on healing of the wound, (3) subsequent limitation of shoulder movement, due to an increase in scarring of the axilla, (4) increased incidence of edema of the arm, (5) possibly psychological, in delaying operation for several weeks, (6) the length of treatment necessary and associated radiation sickness, and (7) nursing difficulties in treating extensive radiation reaction

The classification used by Ash and associates[2] is different from the commonly used Portmann[11] classification They select their patients and treat those in Stages III, IV, and, in some instances, in Stage V These classifications include tumors with retraction phenomena or invasion associated with, or without, axillary nodes, and tumors complicated by distant metastases They report 40% 5-year survival and 16% 10-year survival in this group These authors include the lesions that are 6 cm in diameter in their Stage III group, because these lesions almost invariably show glandular metastases pathologically

Classification of Cases

In the evaluation of our cases, we have used Portmann's[11] method of setting up stages of breast cancer We have modified it by including all tumors, 6 cm or larger, in Stage III, for the reasons of Ash and associates[2] stated above Portmann's[11] classification of breast cancer is as follows

Group or Stage I—The criteria are skin, not involved, tumor, localized in breast and movable, and metastases, none in axillary lymph nodes or elsewhere

Group or Stage II—The criteria are skin, not involved, tumor, localized in breast and movable, and metastases, few in axillary lymph nodes involved, none elsewhere

Group or Stage III—The criteria are skin, edematous, brawny, and red, with induration or inflammation not obviously due to infection, extensive ulceration, and multiple secondary tumors, and tumor, diffusely infiltrating breast, fixation of breast tumor to chest wall, edema of the breast, and secondary tumors

Group or Stage IV—The criteria are skin, as in any other group, tumor, as in any other group, and metastases, axillary and supraclavicular nodes extensively involved, and clinical or roentgenologic evidence of distant metastases

During the period Jan 6, 1936, to June 2, 1942, a period of essentially six and one-half years, 40 cases of cancer of the breast were treated by preoperative irradiation therapy followed by surgery In most cases, this was radical surgery The classification of our cases is given in Table 1

TABLE 1—Patients Treated at the University of Kansas Medical Center with Preoperative X ray Therapy Followed by Surgery

Stage	No of Cases
I	13
II	7
III	16
IV	4
Total	40

These cases have been followed up by annual observation either in our institution or by the patient's local doctor Four patients were lost to follow-up and, for the record, were listed as dead on the last day of contact Two developed malignancy of other organs, which caused their deaths One developed cancer of the bladder, and the other cancer of the antrum One died of leukemia 18 years after treatment for the breast cancer Others died of disease related to senility, such as cardiovascular disease The length of life of the patients from the date on which they were first seen, as related to classification, is listed in Table 2 The percentage of survival is listed in Table 3

TABLE 2—Results of Treatment with Preoperative Radiation Followed by Surgery

	Survival, Yr				
Stage	Less Than 5	More Than 5	More Than 10	More Than 15	More Than 20
I	1	12	9	7	5
II	3	5	2	2	1
III	10	5	3	2	1
IV	4	0	0	0	0
Total	18	22	14	11	7

TABLE 3—Percentage of Survival by Years of Patients Treated by Preoperative Radiation Followed by Surgery

Yr, No	%
5 or more	55
10 or more	35
15 or more	28
20 or more	17 5

Five still living patients who have survived more than 20 years—17 5% of the group of 40 cases—have, respectively, lived 21, 23, 22, 22, and 22 years after surgery One has a stiff shoulder from fibrosis The rest have no complaint relative to cancer or therapy

Table 4 was taken from the report by Ash and associates [2] We have added our data to the report of Dr Robinson,[12] on breast cancer prior to 1943

TABLE 4—Survival of Breast Cancer Patients Given Various Types of Treatment*

Method of Treatment	Survival, % 5-Yr	10-Yr	Type of Case
Untreated (Daland)	22	1	All untreated
Untreated (Nathan and Welch)	19	5	All untreated
Surgery alone (collected cases)	33	32	Cases selected
Presbyterian Hospital (excluding categorically inoperable group)	50	With involvement of axillary nodes Presb Hosp, 20% Memorial Hosp 21%	Cases selected for radical mastectomy mostly Stage I III
Radical mastectomy postoperative therapy (Toronto Hosp)	43	26 (With node involvement, 23%)	82% Stage I III 18% Stage IV V
Radical mastectomy preoperative therapy (Ash et al,[2] Toronto)	40	16	88% Stage IV V
Simple mastectomy, postoperative therapy (McWhirter[8])	42	25	All cases 56% operable
Radical mastectomy preoperative therapy (Orr Tice, Univ of Kansas)	55	35 (12% living beyond 21 yr)	50% Stage I II 50% Stage III IV
Surgery with pre or post operative therapy (Robinson,[12] Univ of Kansas)	44 3		230 cases all stages

* Cases reported by Ash and associates [2] and with cases added from the University of Kansas Medical Center, as reported by Robinson[12] and cases reported by the author

Procedures

Preoperative Radiation—It was our procedure in this group of cases to get a biopsy on all but four of the patients, before therapy was started This was not done in four cases because of the advanced nature of the disease, due to the presence of supraclavicular nodes or lung metastases In some cases in which the tumor was 1 or 2 cm in diameter, an excisional biopsy was done The patient was then immediately started on x-ray therapy Our therapy procedure has changed over the years from the use of 140 kvp in 1930 to cobalt-60 in 1959 When these cases were treated, we had available 250 kvp, with a half-value layer (h v l) of 1 75 mm of copper Treatment varied slightly from case to case, but most of the women received the following radiation Tangential treatment was given medially and laterally to the breast and adjacent chest wall A dose of 1,800 r, measured in air, was delivered to each port The axilla was treated with AP and PA ports A dose of 1,800 r, in air, was given to each area A dose of 1,500 r was delivered directly into the axilla The supraclavicular area was treated by a separate portal, with a dose of 1,800 r

Operation—Surgery in most cases was radical In a few advanced cases the breast was removed and axillary glands were left intact Our figures show that the average delay until surgery was 1 9 months The earliest removal was within two weeks, and the longest delay was eight months Incidentally, in this case the pathology report showed actively, rather wildly growing tumor in crevices of hyaline tissue Obviously, the delay had been too long

Comment—To us the most interesting facet of this survey is a study of the pathologist's report before and after radiation therapy In this study, less change was found in the tumor in the axillary glands than in the primary breast tumor Only occasionally did the pathologist describe hyaline change, fibrosis, and endarteritis in the glands The report in 18 instances described "shrunken, atrophic, or unrecognizable tumor cells" in the breast in instances in which it was known that only a segment of the tumor had been removed for biopsy Increased fibrosis and hyalinization were seen 24 times, endarteritis was described 5 times, and calcification was seen once

Report of Cases

The following two case histories of patients with carcinoma of the breast have been selected as being fairly typical with regard to the response seen in the tumor, as reported by the pathologist after therapy

CASE 1—A female patient, aged 54 years, came to us on March 2, 1936, with a lump in her breast Physical examination was reported as follows "The nipple is retracted There is a lump the size of a hen's egg centrally located behind the nipple It is hard, convex in contour, and apparently attached to the nipple" X-ray therapy was given in the manner described above from March 2 to April 1, 1936

The patient was admitted for surgery on May 10, 1936 Physical examination at this time showed "Some thickening and a little induration of each nipple There was no mass felt There were no axillary nodes felt"

Radical mastectomy was done on May 12, 1936 The pathology report was as follows "Around the walls of the ducts there is an unusual thick layer of a fibrillar type of connective tissue infiltrated with mononuclear leucocytes Some obliteration of blood vessels can be recognized No tumor cells are seen Examination of the lymph glands shows a small lymph gland in which there are patches of fibrous tissue with clusters of foreign appearing cells in some of the lymphatics These are tumor cells, isolated in character, but they are definitely neoplastic Diagnosis—Remnants of carcinoma of the breast following X-ray treatment" This is one of the few cases with definite radiation reaction This patient is living, more than 23 years after treatment

CASE 2—A woman, aged 49 years, was seen on July 3, 1936 Physical examination showed a firm mass, irregular in contour and 6 by 8 cm in diameter, in the upper outer quadrant of the right breast It was attached to the skin in the central portion and reddish purple at the point of attachment No glands were felt

A chest film showed a solitary nodule in the right lung This was considered to be metastatic The patient was seen in consultation by Dr Orr, chief surgeon It was decided to give radiation therapy without biopsy because of the metastasis and the classic appearance of primary breast tumor It was agreed that this would be followed in six weeks by simple mastectomy

Radiation was given from July 5, 1936, to Aug 4, 1936, in the routine manner described above The patient did not keep her appointment for surgery and was seen six months later, on Dec 23, 1936 The tumor was then a small moveable nodule in the breast No glands were felt in the axilla She refused surgery at that time but promised to have it later

On Aug 3, 1937, 13 months after first observation and 13 months after a diagnosis of lung metastasis had been made, she came into the emergency room She had strabismus and was aphasic She died three days later

At autopsy, an indurated mass was found in the breast which showed extensive fibrosis and considerable lipoid granulation tissue on section There were a few foreign-appearing cells, which probably represented remnants of tumor cells that had not been entirely destroyed by x-ray These cells were so degenerated that a positive diagnosis of a primary carcinoma in this area could not be made The original tumor was not distinctly isolated, but evidence of it along with the clinical history suggested to the pathologist that the primary growth was in the breast There was metastasis to the lungs, cerebellum, liver, and axillary lymph nodes

Summary and Conclusions

It was our unique experience, not afforded to many radiologists, of being permitted to treat a group of women with breast cancer prior to surgery This experience was gained so long ago that one can review each case and discuss the outcome of some in terms of almost a generation instead of the usual five-year survival period After radiation therapy, the women were operated on by a competent surgeon The average time of operation was 1 9 months later

My colleagues and I were impressed by the fact that, as proved by subsequent pathological studies, breast cancer may be destroyed by radiation In some cases definite pathological change could be described in the irradiated tissue These changes included fibrosis, hyalinization, and endarteritis

The amount of radiation absorbed by tissue from the air dose given was not exceptionally great, as judged by our present standards It may be assumed that, with the greater dose permissible with use of supervoltage, more significant pathological change may be expected in the glandular areas than was observed 20 years ago

Recognizing the fact that our series of 40 cases, unselected, is small, and that our mode of applying radiation was not very efficient in terms of modern therapy, we must be impressed by the 55% five-year survival and the observation that 17 5% of the patients are alive 20 years later A survey of the hospital record does not indicate that the surgeons believed that healing was impaired or that their work was made more difficult by the preoperative radiation therapy

It is to be hoped that more surgeons can be encouraged to work with the therapeutic radiologist in applying this relatively untried approach to the treatment of breast cancer

Rainbow Boulevard at 39th Street (12)

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Minor Motor Epilepsy

Treatment with Corticotropin (ACTH) and Steroid Therapy

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The most serious hazard of minor motor epilepsy is the associated mental and motor retardation, or both, which is found, in some degree, in essentially all patients. The use of corticotropin or steroids has been recommended in recent publications. The present study comprises 14 children with minor motor epilepsy, mental retardation, and hypsarhythmic electroencephalographic abnormalities. Corticotropin was given alone in eight cases, corticotropin was followed by triamcinolone in one, cortisone acetate was given in two cases, prednisone was given in two cases, and triamcinolone was given alone in one case. In four cases there was improvement with respect to seizures, but in no case was there significant improvement in mental status.

THE FIRST report, to our knowledge, dealing with the use of steroids in epileptic patients was published in 1942 by McQuarrie.[1] He showed that he could produce seizures in patients with epilepsy when they were given a considerable water load and antidiuretic hormone, and that these seizures did not occur when desoxycorticosterone acetate (DOCA) was administered prior to the water-load test.

In 1950, Klein and Livingston[2] studied the effects of therapy with corticotropin, desoxycorticosterone acetate, and cortisone in six children with epilepsy. They observed a temporary remission of seizures and improvement in the electroencephalogram in four of the patients who were treated with corticotropin.

A renewed interest in corticotropin and steroid therapy for epilepsy was stimulated in 1958 when Sorel and Dusaucy-Bauloye[3] reported excellent results in the control of seizures and marked improvement in the mental status of a small group of children with infantile spasms. Following this report other papers have appeared.

Low[4] reported clinical and electroencephalographic improvement in 7 of 10 children with infantile spasms and mental retardation. Cox[5] observed a remarkable improvement, both in the electroencephalographic and mental status, in one patient with infantile spasms. Bower and Jeavons[6] reported a decrease in frequency of seizures and improvement in the electroencephalogram in seven patients with infantile spasms. None of his patients showed changes in their mental status. Plum and Trojaborg[7] observed improvement in the frequency of seizures and the electroencephalogram in some of his eight patients with "salaam" spells and stated that it was "too early to express any opinion regarding improvement in the mental condition of the patients." Stamps and associates[8] reported "dramatic improvement," both in the control of seizures and also in the mental status, "in at least 30 per cent" of 60 patients with hypsarhythmia. Dobbs and Baird[9] administered corticotropin and steroids, or both, to 43 children with minor motor epilepsy and reported that "although the administration of corticotropin and corticosteroids to an affected child is often associated with improvement of the seizure pattern and the EEG, we have not as yet observed normal development in language and adaptive ability."

The primary purpose of this present investigation was to study the effect of corticotropin and steroids, or both, on the mental status of children with minor motor epilepsy.

Definition of Terms.—Four different terms have been used to designate the type of epilepsy treated with corticotropin and steroids by the various investigators mentioned above: minor motor epilepsy, infantile spasms, salaam spasms, and hypsarhythmia. Actually these terms refer to the same type of epileptic seizures which consist essentially of sudden flexion of the head with simultaneous extension of the upper extremities and flexion of the thighs on the abdomen. They are of very short duration, lasting several seconds or so, and fre-

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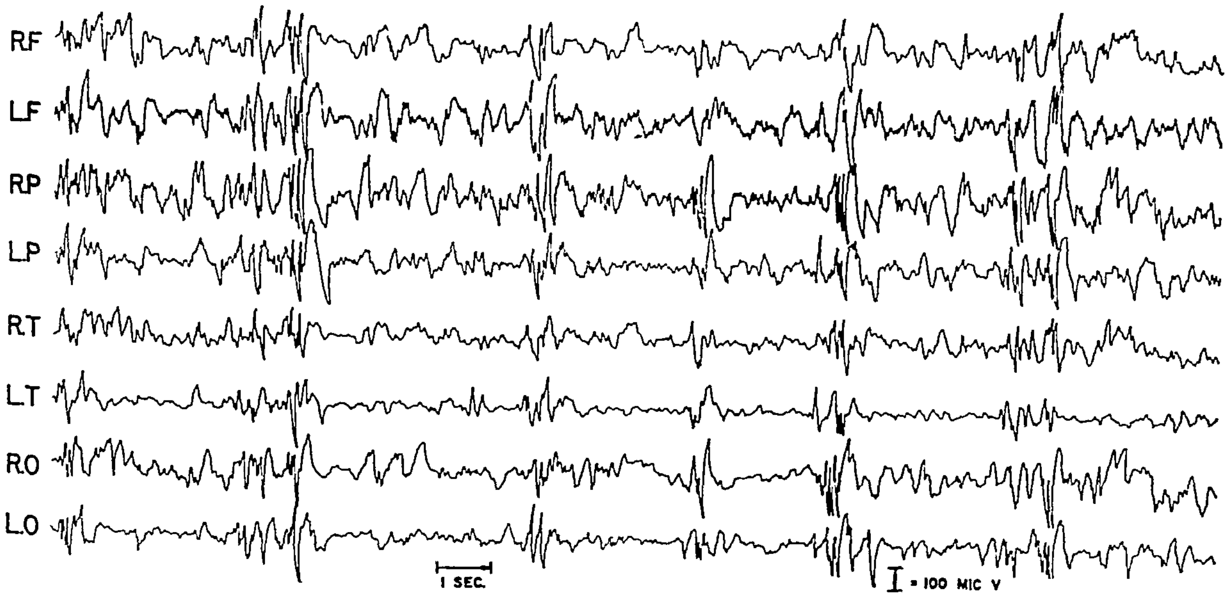
quently recur in rapid succession (series), lasting 5 to 10 minutes. Some patients have as many as from 50 to 100 attacks daily. The seizures most often make their initial appearance early in life, usually between the ages of 3 to 12 months. There is almost invariably some evidence of organic brain damage, such as mental, and motor retardation, or both, or cerebral palsy. Patients with this type of epileptic seizure almost always reveal abnormalities in their electroencephalogram such as are shown in the figure. These electroencephalographic abnormalities have been classified by Gibbs and associates[10] as hypsarhythmia.

Materials and Methods.—This study comprises 14 children with minor motor epilepsy, mental retardation, and hypsarhythmic electroencephalographic abnormalities who were treated with corticotropin and steroids, or both. 8 received corticotropin, 5 steroids, and 1 corticotropin and subsequently steroids.



Electroencephalographic tracings from Case 1 performed during light sleep induced by sodium propylmethylcarbinylallyl barbiturate (Seconal) shows high voltage random slow waves and spikes and also short bursts of fast waves and high voltage spikes (These abnormalities are of the type which Gibbs and co-workers classified as hypsarhythmia

Corticotropin (Acthar-Gel) was administered intramuscularly daily for at least three weeks, except in one patient who received the therapy for only 12 days. The dose varied from 10 to 40 mg daily. Steroids were prescribed daily for periods ranging from three to seven weeks. The dosages varied considerably and are given in the individual case histories.

Serial electroencephalographic examinations were performed on 11 of the 14 patients.

Report of Cases

All of the patients reported in this paper had an initial work-up which consisted of complete history, physical, neurological, and electroencephalographic examination, roentgenographic examination of the skull, blood chemistries (including fasting blood sugar), complete blood counts, and urine examination (including study for phenylpyruvic acid). Only significant positive findings are mentioned in the subsequent case reports. All of these patients, except Case 5, were studied for at least one year after the onset of therapy.

Case 1.—A female patient, two years of age, had a normal birth history. The onset of spells occurred at three months of age. She was known to be a slow child since the age of five months. No previous therapy was administered for seizures. She was seen first by us at the age of two years at which time she was having daily seizures and presented evidence of marked mental retardation. The electroencephalogram showed typical hypsarhythmia. Corticotropin, in doses of 15 units daily, was given for four weeks. The dosage was gradually reduced, and the drug was discontinued completely in two weeks. The seizures stopped after the second day of therapy and the patient remained seizure-free for the duration of treatment. The electroencephalogram reverted to normal. No significant improvement in her mental status was observed. The seizures recurred soon after the corticotropin therapy was discontinued but were less frequent. Repeated electroencephalographic examinations continued to show minimal abnormalities.

Case 2.—A female patient, seven months of age, had had a normal delivery but leaking of amniotic fluid was noted for a few days during the seventh month of gestation. Her neonatal period was unremarkable. The onset of seizures occurred at the age of three months. The seizures continued in spite of treatment with different anticonvulsant drugs. She was seen first by us at the age of seven months at which time she was severely mentally and physically retarded. The electroencephalogram showed hypsarhythmia. Ten units of corticotropin was given daily for one week, and 20 units daily for the next two weeks. The spells continued with the same frequency Her electroencephalogram remained unchanged, with no mental improvement

Case 3—The parents of a female patient, 28 months of age, stated that her development was normal until the age of 15 months at which time the child suffered a brief febrile illness of unknown cause Subsequently her mental development slowed down, and at the age of 17 months she began having minor motor seizures which became progressively more frequent in spite of treatment with various anticonvulsants She was seen first by us at the age of 28 months at which time she was severely defective mentally and was having daily minor motor seizures Her electroencephalogram showed hypsarhythmia Corticotropin was prescribed daily, 25 units the first week, 30 units the second week, and 40 units the third week, all without benefit The electroencephalogram showed abnormal findings No improvement in mental status was noted

Case 4—A male patient, 22 months of age, showed normal birth history The onset of seizures occurred at the age of 20 months He was treated with anticonvulsant medication for two months with no success He was seen first by us when he was 22 months of age He was markedly retarded His electroencephalogram showed hypsarhythmia Corticotropin, in doses of 25 units daily, was given for the first week and was increased to 40 units daily for the next two weeks During the second week of treatment the spells stopped completely The electroencephalogram showed reversion to normal Seven weeks later the seizures recurred, and at the time of this report he was having frequent seizures No significant change in mental status was seen

Case 5—A male patient, 13½ weeks of age, with a normal birth history, had onset of seizures at 10 weeks of age When he was 13½ weeks old, corticotropin therapy was started Fifteen units was administered daily for 12 days The parents became discouraged and refused to continue therapy longer No decrease in frequency of seizures was observed His electroencephalogram showed hypsarhythmia The child appeared to be slow for his chronological age We have been unable to follow-up this patient

Case 6—A female patient, 27 months of age, had a normal birth history The onset of minor motor epilepsy occurred at the age of seven months She was treated with several medications without benefit, and was seen first by us at the age of 27 months at which time she was severely retarded, mentally and physically Her electroencephalogram showed hypsarhythmia Corticotropin, in doses of 25 units daily for three weeks, was administered The seizures continued with the same frequency No improvement in her electroencephalogram or mental status has been noted, she has been followed-up by us in the Sinai Hospital, Baltimore

Case 7—A female patient, 10 months of age, had a normal birth history Minor motor seizures were first noted when the child was four months old Subsequent treatment with various anticonvulsants was unsuccessful She was seen first by us when she was 10 months of age at which time she was having frequent seizures and showed evidence of slow mental development Her electroencephalogram revealed hypsarhythmia The patient was referred back to her family physician with the suggestion that she be treated with corticotropin, in doses of 15 units daily for three weeks The physician apparently misunderstood the directions, and the child was given the drug, in doses of 15 units daily for a period of three months We were informed by the physician that she developed Cushing's syndrome, and that there was no decrease in the frequency of the seizures nor significant improvement in the mental status

Case 8—A male patient, eight months of age, had been delivered by Caesarean section at term He had had difficulty in breathing at birth His neonatal period was unremarkable At seven months of age he began having daily minor motor seizures He was seen by us at the age of eight months at which time he showed evidence of retarded development His electroencephalogram showed hypsarhythmia He was treated with daily injections of corticotropin, 20 units the first week, 30 units the second, and 40 units the third There was a marked decrease in the frequency of seizures during the third week of treatment The electroencephalogram remained severely abnormal The seizures recurred soon after the therapy was discontinued, but less frequently There was no significant improvement in the mental status

Case 9—A male patient, six months of age, had a normal birth history The onset of minor motor seizures occurred at the age of two months He was seen first by us when he was six months old His electroencephalogram showed hypsarhythmia Triamcinolone (Kenacort) in doses of 28 mg daily, was prescribed for three weeks There was no decrease in the frequency of the seizures and the electroencephalographic findings remained abnormal There was no change in the mental status

Case 10—A female patient, 15½ months of age, had a normal birth history Her minor motor seizures were first noted at three months of age She also presented evidence of retardation at that time The electroencephalogram showed hypsarhythmia The child was treated with many anticonvulsant drugs without benefit At the age of 15½ months she was severely retarded, both physically and mentally, and was still having daily seizures Prednisone (Meticorten), in doses of 30 mg daily, was prescribed for three weeks, and then the dosage was gradually tapered off over a period of two weeks The electroencephalogram remained abnormal The seizures continued with the same frequency, and no improvement in mental status was noted

Case 11—A male patient, 4 months of age, had a normal birth history The onset of minor motor epilepsy occurred at the age of three months He was seen first by us when he was four months old at which time he manifested definite signs of retardation The electroencephalogram showed hypsarhythmia The child was given a three-week trial on cortisone acetate (Cortone), in doses of 15 mg daily His parents reported a slight reduction in frequency of seizures during the course of therapy, but after the drug was discontinued, the spells became more frequent No change in the electroencephalographic findings nor improvement in mental status was noted

Case 12—A female patient, two years of age, had a normal birth history Minor motor seizures were first noted at 18 months of age She was treated at another clinic with anticonvulsant drugs without benefit The child was seen first by us at the age of two years She was severely retarded mentally and was having daily seizures Her electroencephalogram showed hypsarhythmia Prednisone (Meticorten), in doses of 40 mg daily, was given for the first week, and during the subsequent six weeks the dosage was gradually decreased No improvement in the mental status nor in frequency of the seizures was noted

Case 13—A male patient, 4½ years of age was seen The mother had had moderate vaginal bleeding during the sixth month of gestation and profuse bleeding one day prior to delivery of the patient The child was delivered by Caesarean section He was anoxic at birth and was placed in oxygen for three days He was seen first by us when he was 23 months old The patient was severely retarded mentally and was having daily seizures The parents stated that the patient's seizures started "at birth It is of interest to note that the mother stated that she felt 'continuous jerking movements of the baby during the last month of pregnancy" The electroencephalogram showed hypsarhythmia The patient was treated with various anticonvulsant drugs without improvement When he was four and one-half years of age he was given a four-week trial on cortisone acetate (Cortone), in doses of 200 mg daily No change in the frequency of seizures or mental status was noted

Case 14—A male patient, 8 months of age, had a normal birth history At the age of nine days he had a brief right-sided seizure associated with fever Minor motor seizures were first noted at six months of age He was treated at another clinic for a short period with anticonvulsant drugs, but without benefit He was seen first by us when he was eight months old at which time he was retarded and was having daily seizures His electroencephalogram showed hypsarhythmia Corticotropin, in doses of 10 units daily, was given for one week and 20 units daily during the subsequent two weeks, the medication was tapered off during the fourth week During the fourth week of therapy, the seizures stopped and the patient remained seizure-free for three months Subsequently the seizures recurred and became more frequent than previously He was then given a three-week trial on triamcinolone (Kenacort), in doses of 32 mg daily With this therapy, the spells increased markedly in frequency No significant improvement in the mental status was noted The electroencephalograms were abnormal

Results

Improvement in seizures was observed in four patients who received corticotropin (ACTH) (see table)

Responses of Fourteen Patients to Therapy with Corticotropin Steroids or Both for Minor Motor Epilepsy

Case No	Improvement in Seizures	Improvement in Electroencephalogram	Improvement in Mental Status
		Corticotropin	
1	Controlled	Reverted to normal	
2			
3			
4	Controlled	Reverted to normal	
5			
6			
7			
8	Improved		
		Steroids	
9			
10			
11			
12			
13			
		Corticotropin and Steroids	
14	Controlled*		

* Controlled for three months on corticotropin seizures then recurred and did not respond to steroids

In Case 1, the seizures stopped after the second day of therapy, but recurred in lesser frequency several days after the corticotropin therapy was discontinued In Case 4, the seizures stopped during the second week of treatment, and the patient remained free of seizures for seven weeks Subsequently they recurred as frequently as before the therapy was instituted Case 8 showed a marked decrease in the frequency of seizures during the third week of therapy The seizures continued infrequently after the therapy was discontinued Case 14 received corticotropin therapy for four weeks During the fourth week of therapy, the seizures stopped and did not recur for a period of three months Soon thereafter they recurred and did not respond to steroid therapy

Electroencephalographic findings showed improvement in two patients (table) In cases 1 and 4, the repeated electroencephalographic examination, performed three weeks after corticotropin therapy was started at which time both patients were seizure free, revealed an essentially normal brain wave pattern

There were no significant changes in the mental status of any of our 14 patients All of these patients except Case 5 were followed up by us for at least one year after the therapy was started

Comment

Our results with corticotropin and steroids in the treatment of the 14 patients presented in this study are essentially the same as those reported from this clinic in 1950[2] Although the latter group of patients did not have minor motor seizures, the electroencephalographic examinations showed abnormalities somewhat similar to those seen in patients with minor motor epilepsy Temporary remission of seizures and improvement in results of electroencephalographic examinations were observed in some of the patients in each group treated with corticotropin No improvement, clinical or electroencephalographic, was observed in association with steroid therapy

In view of this finding, one has to consider the possibility that corticotropin played some part in controlling the seizures and also in improving the results of electroencephalographic examinations in these patients However, we believe it is impossible to adequately evaluate the efficacy of corticotropin therapy in these patients since it is known that similar temporary cessation of seizures and changes in electroencephalographic pattern are seen in some untreated patients with minor motor epilepsy (spontaneous remission) and also in some patients who are treated with anticonvulsant drugs It is also important to note that in the natural course of minor motor epilepsy, the seizures have a tendency to disappear with increasing age

We were not greatly impressed by the overall effect of corticotropin and steroids as anticonvulsive agents in view of the findings in this clinic in 1950 We administered corticotropin and steroids, or both, to the 14 patients presented in this paper, not primarily to study the effect of this therapy on the seizures and electroencephalograms, but to determine their effect on mental status because of the excellent results initially reported by Sorel and Dusaucy-Bauloye[3]

A review of the subsequent reports in the literature in regard to the effect of corticotropin and steroids, or both, on the mental status of patients with minor motor epilepsy revealed divergent conclusions Sorel and Dusaucy-Bauloye,[3] Cox,[5] and Stamps and associates[8] reported favorable results On the other hand, Bower and Jeavons,[6] Plum and Trojaborg,[7] and Dobbs and Baird[9] did not observe any significant changes

None of our 14 patients revealed significant improvement in their mental status In several instances, the parents reported some changes which they construed as indicative of mental and motor improvement, or both It was our impression, however, that these patients continued to present a marked evidence of retarded development, and that the "improvement" reported by parents were changes one would expect to find in most mentally retarded children with increasing chronological age

We are unable to explain the differences in findings in regard to the effect of corticotropin and steroid therapy, or both, on the mental development in patients with minor motor epilepsy We used, essentially, the same dosage of corticotropin and continued the therapy for the same period of time as that recommended by Sorel and Dusaucy-Bauloye[3] Stamps and associates[8] treated some of their patients with higher doses and for longer periods of time This may possibly be one explanation for the better results that were obtained by them We did, however, treat one patient for three months, and in spite of this prolonged therapy, the patient did not improve either seizure wise or mentally

Minor motor epilepsy, in our experience, is the most difficult of the epileptic seizures to control with any of the available anticonvulsant drugs We have had essentially poor results with each of them The ketogenic diet regimen is the only type of therapy with which we have had statistically significant good results in controlling the seizures It is of interest to note that 3 of the 14 patients included in this study were subsequently treated with the ketogenic diet At the time of this writing one patient, Case 6, has been completely free of seizures for period of one year, and in the other two, Case 3 and Case 14, the frequency of seizures was markedly reduced for one year

The most serious hazard of minor motor epilepsy is not necessarily the seizures themselves but the associated mental retardation These seizures tend to disappear as the child grows older, and it is rare to find typical minor motor epilepsy in children much older than four or five years of age Many of these patients subsequently develop other types of epileptic seizures

Mental and motor retardation, or both, is almost a constant finding in patients with minor motor epilepsy Evidence of retarded development may not be apparent in those children in whom the seizures begin during the first few months of life but becomes evident in practically every patient during the course of this disorder The degree of retardation varies from mild to severe In our experience the vast majority of patients with minor motor epilepsy manifest marked evidence of mental retardation as they grow older For many of them institutionalization is the most appropriate measure We have not observed any significant improvement in the mental status of our patients who were completely controlled of their seizures for a prolonged period of time with the ketogenic diet This finding would indicate to us that the cerebral changes which are responsible for the mental retardation in patients with minor motor epilepsy are not reversible

The cause of minor motor epilepsy is not known Many factors have been considered such as prenatal developmental disturbances, cerebral damage acquired in the prenatal, natal, and postnatal period, biochemical abnormalities, defects in cerebral metabolism, encephalitis, and birth injury We have nothing significant to add as far as the etiology of this condition is concerned at this time In the past we have always considered minor motor epilepsy to be the result of a "congenital cerebral defect of some type"

Summary

A review of the literature revealed that there is a diversity of opinion in regard to the effectiveness of corticotropin and steroids, or both, in controlling the seizures and improving the mental status of children who suffer with minor motor epilepsy (infantile spasms, salaam spasms, hypsarhythmia)

The case histories of 14 of our patients with minor motor epilepsy treated with this type of therapy are presented There was a temporary improvement of seizures, none of the 14 patients showed any significant improvement in their mental development

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SPECIAL CONTRIBUTION

The Clinical Clerkship in Medicine

Keystone of the Arch of Undergraduate Medical Education

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JOHNS HOPKINS developed what was probably the first clinical clerkship with student responsibility in this country. As I took this course in 1914, I carried out such laboratory procedures as blood counts and urinalyses, assisted in ward procedures, and took rather abbreviated histories, but the chief emphasis was on physical diagnosis. In step with the times, this was done in an elaborate way with the goal of anticipating the gross autopsy findings. Most other institutions did not permit students on the wards at all or allowed only a few with top grades to stand in the rear during rounds.

When I began to teach the clinical clerks at Columbia a few years later, the students were barely tolerated and spent much of their time using the centrifuge as a roulette wheel. In the early 1920's, as we began to realize the extraordinary opportunity provided by the medical clerkship, the course was changed to the third year, and a laboratory with individual desks was built at the old Presbyterian Hospital. When we moved to the new Columbia-Presbyterian Medical Center in 1927, a desk was provided for each clerk. There has been a gradual evolution in our management of this course with early and steadily increasing emphasis on history taking and integration of data. Later I shall detail our present goals. I am convinced that the medical clinical clerkship is the keystone of the arch of undergraduate medical education.

In the course of these four decades I have seen and participated in extraordinary changes in medical science, medical education, and medical practice. I make this trite, oft-repeated comment in order to develop my theme by recalling some of the factors concerned with these changes. While the material achievements have been tremendous, with the progress in physics, chemistry, microbiology, and psychology, widening our knowledge and bringing new techniques that permit remarkably accurate studies, yet the fresh philosophical approaches are equally spectacular. Two of the most important of these advances are (1) the concept of medicine as the science of human biology including the emotions as well as the physical apparatus, and (2) introduction of the ideals of academic scholarship, first into the preclinical and later, into the clinical departments.

Research

With the introduction of academic full time into the clinical areas we no longer have the invidious contrast between 'basic' and 'clinical research.' All research in medicine can now be properly classified as *basic*, i. e., searching for new fundamental natural laws, *descriptive*, i. e., classification of natural phenomena for purposes of better understanding or further study, or *applied*, i. e., seeking practical uses for discoveries made in basic research. While the proportion of each type may vary with the department involved, all sections of the medical school have the same scientific standards.

A significant result of these new concepts is progressive awareness of the total individual. It is my belief that this is not essentially a contribution of the behavioral sciences but is an inevitable result of the application of academic scholarship to the problems of human biology; how could the human individual be scientifically studied without concern for all his facets? The psychological aspects of personality in the individual belong to medicine, whereas sociology is involved, in main, with group behavior.

The point of view I have just enunciated has led me to state elsewhere that 'the goal of medical education is to produce a scholar in the science of human biology who will practice his profession as

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Address delivered at the University of Kansas Medical Center Faculty Conference on Medical Education, Aug. 29, 1960.

a perceptive humanist." The dedication and compassion of the humanist are largely inborn and can be cultivated by example and atmosphere, the primary task of medical school is to transform a layman into a medical scientist.

There is a general awakening to the realization that in all education, notably medical education, the outstanding goal is to train the student's mind to be a "discriminating instrument" rather than a "temporary storehouse of miscellaneous information . . . retained long enough to be reproduced at the moment of examination," as Prof. Pickering so aptly expresses it. Disciplined intellectual power is more valuable than knowledge, but the successful teacher finds no mutual exclusiveness between the development of critique and the communication of facts, indeed the derivation of facts, and their meanings are the material one uses to inculcate logic and the experimental method.

Introduction to Attitudes of a Scientist

The college years can accomplish a good introduction to the attitudes of a scientist, but much of the material has no apparent relevance to later life. In medical school, on the other hand, it is progressively easy to relate curriculum content to future usefulness. Yet, even here, there are, fortunately, enough data sufficiently remote from apparent practicality to permit exercise of the discipline that demands attention from the student when there is no excitement over the subject matter, the discipline that other generations obtained from the classics.

There is no better way to train the student's mind in logic and critique than by his participation in research, the appreciation of multiple variables, of the value of controls, of the dangers of coincidence are all learned the hard, but enduring, way as the experimental method is applied to a definite problem. The chief value of the student's research is educational, but it is also one of the most satisfactory ways by which the faculty can carry out a high duty, viz., the discovery of talent, the recognition of a natural scholar.

Each new case that comes to the physician is truly a research problem, some very easy, others almost hopelessly complex, for data are often inaccurate, and there may be many unmeasurable factors. The final integration requires wisdom and a well-trained mind but also a paradoxical combination of self-confidence and humility.

As the medical student becomes familiar with the necessary facts about human biology, he should learn the stories of their derivation, if he discovers the deductive and experimental processes that produced the great advances in medicine, he will become a better oriented scientist. In addition, he should be taught the sources of information, how to find them and how to digest them. He will have to rely on his own efforts later if he is to keep abreast of his profession.

A difficult, but highly important, goal of undergraduate medical education is the constant cultivation of a sense of *responsibility*. Example and precept must show the student that stern self discipline is the basic ethics of the physician. There is no place for tangential emotional or unsound scientific behavior, wishful thinking must be suppressed, intellectual integrity is as essential as moral integrity. There is no course in which this facet is more clearly defined than in the medical clerkship.

It is generally accepted that the purpose of medical education on the undergraduate level is not to accomplish the training of a practitioner but to lay a scientific foundation upon which to erect a career in patient care, research, teaching, public health, or any of the various opportunities open to the recipient of the M.D. degree. It is my impression that the entire curriculum should be oriented in content to human biology and its disease-induced deviations. If the philosophy is sound, such a direction of content runs no danger of creating a trade school atmosphere. Each department can carry on the type of research or postgraduate education that its interests and capabilities may suggest, and thus maintain the essential pride in its own special discipline. But the student should have a common purpose under the chairmanship of internal medicine.

Pursuant to the point of view I have outlined, the program of the first two years should give the student a familiarity with general biology, i. e., the general physiology of the cell as a biochemical prototype, its genetics and its enzymes, with the dynamic mechanisms peculiar to human biology, with basic psychology including personality development, and with the external threats to man, i. e., microbiology, parasitology, chemical, and physical hazards. The dynamic mechanisms, cardiorespiratory, gastrointestinal, etc., should not be departmentalized, but oriented to the role which they will perform in the clinical analysis of a total human being and should incorporate the abnormal with the normal patterns. The student thus arrives at the third year holding a series of threads that he must learn under the tutelage of internal medicine to weave into the design that constitutes the appraisal of a single individual, his health, his personality, and his environment. Appraisal is the proper word to express this achievement, for diagnosis in its classical sense is only one facet of our approach in modern medicine. By the same token, management should replace treatment as the term to describe the physician's function following appraisal.

Development of Internal Medicine

Before turning to the clinical clerkship itself, I would like to recall a few of the high lights of internal medicine's progressive development in the past five decades. The turning point came with the introduction of academic full time into the clinical departments I was a fourth year student at Johns Hopkins when Dr Janeway became the first truly academic professor of medicine and even in that first step of academic evolution the improvement was apparent Establishment of laboratories of basic research in the clinical departments was equally influential in the development of the clinical scholar His approach to disease problems was implemented in steadily increasing degree by the new understanding of fundamental physiological and immunological mechanisms This resulted eventually in attaining an extraordinary degree of accuracy in physical appraisal A happy result of this accuracy in determining the organic status was an increasing ability to define the role of the emotions, thus personality appraisal could become a routine part of the investigation of a patient The large amounts of time spent in other departments (exclusive of pediatrics and psychiatry) on the development of highly specialized technical dexterities can, in medicine, be devoted to perfecting the integrative potentials of a human problem This integrative process is, in some institutions, rather tautologically called "comprehensive medicine", there is, however, no other kind of medicine

The special role of the internist in undergraduate teaching is indicated by the fact that in most schools more hours are assigned to the Department of Medicine than to any other In hospitals and group clinics, the internist is usually designated as distributor of new material, except perhaps accident cases But the most important development is the internist s gradual supplanting of the general practitioner as family physician We have the following statement framed and hanging in our staff room at the Presbyterian Hospital The family physician should supersede the general practitioner and it is the function of the well trained internist to be the family physician His role is to know the patient and his environment, to care for him and his family in health and illness, to guide him to specialists when his problems require their skills and at all times to be his counselor and friend ' It is at last being conceded that a scientific training does not inhibit compassion and that intuition loses nothing when combined with a knowledge of psychological mechanisms

If one were to accept the theses that I have offered, it would not be too difficult to believe that the clinical clerkship in medicine is the most fruitful course in the four years of undergraduate medical education, the keystone of the arch

Goals of Clinical Clerkship

May I present the goals of the clinical clerkship as we have come to appreciate them at Columbia? I shall first enumerate them and then elaborate briefly on each I place them somewhat in order of importance, although each has its own priorities

1 Training in history taking
2 Assembling the clinical material into an analytic summary
3 Development of critique as to the indications, accuracy, and interpretation of objective data, laboratory, x-ray, etc
4 Familiarity with basic pathological mechanisms and the disease entities they produce
5 Practice in physical diagnosis with recognition of its limitations
6 Experience with medical procedures, such as lumbar punctures, transfusions, etc
7 Experience with management of medical emergencies
8 Recognition of the role of the specialist as consultant
9 Assumption of responsibility under rigid discipline
10 Introduction to the doctor-patient relationship

A good history is the most important component in the investigation of a patient, and it offers the most comprehensive pedagogical opportunity in the whole curriculum There is no better test of a physician s competency than the quality of his histories Our students take their histories from an outline that has been frequently revised, and turn them in to a preceptor who teaches a group of six to eight men The histories are often rewritten three or four times before they are approved for entry into the hospital chart Each history is, in effect, an original paper, corrected rigidly on English composition, logic, accuracy, and scientific drive Vagueness is not permitted, no such words as 'occasionally" or infrequently" are accepted There must be, when possible, quantitative estimation of symptoms charted against the coordinate, time, e g , number of stairs producing dyspnea, a satisfactory present illness should lend itself in part, at least, to plotting on graph paper While taking a history the student learns about personality, environment, occupation, economic status, interpersonal relationships, and has his first practical experience in doctor-patient communication With conscientious preceptorship the meaning of all the facts in the history will be illuminated, thus he learns disease mechanisms and disease entities in a way that enlightens his textbook study History taking is exciting, it furnishes a ringside seat to the human drama From our patients we learn the most valid facts about politics, labor unions, business, and many other types of activity that are outside the usual realms of a physician's experience, and the more eagerly one satisfies his curiosity, the better able is he to manage his patient Stern insistence on the highest standards in history taking is little appreciated by the students while they are undergoing it, but there is no aspect of their education that is recalled more enthusiastically after some years

In the second half of the clerkship, the students are required to write an analytic summary of each case. This includes history, physical examination, laboratory and x-ray data, and consultations. The clerks are taught that there are three stages in the approach to a patient, first, collection of data, including the history, next, an analytic summary of these data, and finally, a sophisticated appraisal of the total situation, including management. Exposition of the first two is appropriate to the clerkship, the final integration is best taught in the residency. The summary is an exercise in relevancy and component interpretation. It is one of the most fruitful methods of teaching logic, critical thinking applied to the use of multiple variables of widely different values. Summarizing the history opens with a personality portrait and its environmental setting, therefore, as the summary proceeds to past and present illnesses, it comes to life in relation to a definite individual, the physical examination is presented only as it reveals the physical status, with no detailing of signs and includes information derived from x-ray and electrocardiogram. Laboratory work is offered in relation to its meaning by dynamic units, for example, what we so carelessly call "liver chemistry" is presented as it bears on total liver function (bromsulphalein [BSP] etc.), biliary obstruction (alkaline phosphatase, serum bilirubin) or evidence of tissue destruction (cephalin flocculation), not in a hodge podge of memory groping. The analytic summary is the model of case presentation.

One of the rather bitter, and often justified, criticisms of medicine is directed to the thoughtless and extravagant use of expensive laboratory and x-ray work. The clerkship offers an exceptional opportunity to teach the valid indications for such work, at the same time, the student learns to evaluate accuracy, reliability, and proper areas of interpretation. The ordering of unnecessary tests should rank close, in carelessness, to the omission of a significant diagnostic procedure. We require our students to understand the principles underlying the various complicated determinations, and they are expected to follow on their own initiative, interesting or positive results to the chemical, microbiological or electrocardiographic laboratories and to see the x-rays and fluoroscopies on their patients. This is a learning process as contrasted with the positive teaching of histories.

There is an intensive course on physical diagnosis in the second year, hence the clerkship is essentially a practice period. Here again, it is learning rather than positive teaching, though there are instructors available to the student who is in difficulty with his techniques. The checking of physical signs with x-ray, electrocardiographic and autopsy results gives the novice an insight into their relative accuracy.

As histories are taken and corrected, summaries written and discussed, the dynamic mechanisms to which the student has been introduced in the first two years assume fresh significance with a much clearer understanding of their meaning. They are at the same time assembled into recognizable disease entities. In this way, the student learns a great deal of textbook medicine.

The experience of the clinical clerk is enriched by the daily activities of a medical service, for example, the care of emergencies, observation of drug idiosyncrasies, participation in medical procedures, lumbar puncture, transfusions, etc. He can learn a great deal and will be taught as much as his initiative demands.

The contributions of the surgeon, gynecologist, psychiatrist and other specialists, to the appraisal of his cases give valuably different points of view.

While not every student offers fertile soil for the implanting of a sense of responsibility, we feel that the clinical clerkship is the first, and one of the best, opportunities for testing the capacity of a prospective physician to realize what it means to accept the grave obligations involved in caring for the health of another human being. Our clerks are on 24 hours call and cover week-ends and holidays, they have their own laboratory desks and perform all the clinical pathology on their own cases, no one else takes a formal detailed history. The dangers of careless inaccuracy are made clear, and they are promised expulsion for a "sink test." We have actually required a student to repeat his entire third year, in spite of satisfactory grades, because he neglected the laboratory work on his cases. Rigid discipline is essential, but an atmosphere in which duty is as highly respected as scientific acumen provides the most potent influence of all. Duty implies the intellectual acceptance of a responsibility, dedication adds a vitalizing emotional component with only the slight hazard that emotions may occasionally submerge common sense.

Contribution of the Clinical Clerkship

The clinical clerkship in medicine makes an exceedingly important contribution as it reveals the students who need help in the doctor-patient relationship. The innately warm and perceptive need little guidance in dealing with the sick, but there are not a few young people whose personalities in some degree inhibit or embarrass the communication so essential to good medical care. These students need patient and sympathetic reeducation which can be done much more effectively on the basis of actual ward episodes that can clarify the behavior problem.

Every doctor, no matter what his special relationship to the care of the sick may be, should have some of the qualities of the family physician, if he is to offer more than mere technical dexterity. Internal medicine has the serious duty of imparting to the medical student the joys, the responsibilities and the scientific obligations of this role and can accomplish the first enlightenment by means of the clinical clerkship.

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CLINICAL SCIENCE

Low-Molecular-Weight Dextran

Eugene F Bernstein, M.D., and Robert L Evans Ph.D., Minneapolis

Toxic reactions to currently employed iodinated water soluble radiopaque media have been responsible for the occurrence of considerable morbidity and some deaths after such diagnostic procedures as cardioangiography, aortography, arteriography, and pyelography [7,12,23] The mechanism of these reactions has been the subject of intense clinical interest for some time However, until quite recently, no satisfactory explanation for many of the observed clinical and experimental reactions had been advanced [21] The role of allergic phenomena has been seriously challenged by Sandstrom,[26] who clearly indicates that there is no evidence for the value of pretesting or prophylaxis, history of previous contact, or proof of antigen-antibody reaction Other authors agree that pretesting and prophylactic antihistaminics are of little value in predicting or preventing these reactions [12]

Recent studies by Read [24] have demonstrated that the phenomenon of diffuse intravascular red-blood-cell sludging occurs after the intravenous injection of a number of hypertonic solutions, including the more concentrated iodinated radiopaque media These red-blood-cell aggregates were directly visualized in the pia mater, the small bowel mesentery, and the subcutaneous tissue Isolated perfusion studies indicated that pulmonary vascular resistance and pulmonary artery pressure increased markedly after the injection of hypertonic media but only did so in the presence of red blood cells Observations of the corneoscleral blood vessels in 24 human patients by Sobin and his associates [27] have identified similar changes in the microcirculation and the development of red-blood-cell masses in these vessels after the intravenous injection of diatrizoate (Hypaque) sodium and sodium diprotrizoate (Miokon) These vascular alterations occurred within minutes after injection and, in general, spontaneously resolved 20 minutes after the administration of the radiopaque material Similar observations of the conjunctival blood vessels made in this laboratory confirmed the rapid development of red-blood-cell aggregates after the intravenous administration of diatrizoate sodium in the dog [3]

Observations of the microcirculation in the conjunctival vessels with development of intravascular aggregation or agglutination of red cells has been described for a number of other conditions In 1942, Knisely [18] described this phenomenon in association with malaria and later, in 1945, its occurrence after traumatic shock [10] These studies were confirmed by Bigelow and his associates,[4,15] who observed intravascular agglutination of erythrocytes in conjunctival, omental, and mesenteric vessels Bigelow's studies indicated that the sludging was more severe with traumatic shock More recently, Swedish investigators reconfirmed these findings Gelin [13,14] and others [5,28] found that prophylaxis or treatment with a low-molecular-weight fraction of dextran will prevent or reverse the development of red-blood-cell aggregations and the accompanying decrease in hemoglobin level, central hepatic necrosis, renal tubular damage, and punctate myocardial necrosis that occur after trauma

Recent experimental and clinical observations made at this clinic by Long and Lillehei [22] have indicated the development of similar red-blood-cell aggregation after prolonged cardiopulmonary bypass and have demonstrated the beneficial effect of low-molecular-weight dextran in preventing the development of this reaction.

An experimental evaluation of the protective action of this dextran fraction upon the toxic reaction associated with the administration of large intravenous doses of 90% diatrizoate sodium solution was therefore undertaken in an effort to determine whether the red-blood-cell aggregation observed by Read and Sobin after administration of diatrizoate sodium was related to that observed after trauma, hypothermia, and prolonged cardiopulmonary bypass and to ascertain what protection, if any, might be offered by pretreatment with low-molecular-weight dextran

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Methods and Materials

Mongrel dogs of both sexes, weighing between 5 and 14 kg (11 and 31 lb respectively) were used for this study They were anesthetized with pentobarbital in a dose of 30 mg per kilogram of body weight Fifty-seven animals were used in acute toxicity and mortality studies In these, the aortic or femoral blood pressure was monitored with a Statham P-23D strain gauge or a Sanborn Electromanometer and recorded on a Sanborn Twin-Viso Lead 2 of the electrocardiogram was also recorded In 12 of the dogs, the conjunctival blood vessels were observed with a dissecting microscope A 90% diatrizoate sodium solution was administered to groups of dogs in graded doses ranging from 1 to 9 cc per kilogram of body weight This material was rapidly injected into the vena cava via a jugular or femoral vein catheter connected to a stainless steel syringe in a hand-lever injector The material was injected in less than five seconds, with apparatus currently employed for intravenous aortography

In the pretreated animals, 10 cc per kilogram of body weight of 15% low-molecular-weight dextran (molecular weight approximately 40,000) in 5% dextrose water was administered intravenously over a 2-minute period, 10 minutes prior to the injection of diatrizoate sodium This dosage was arrived at after several exploratory observations with a range of dextran doses which, in general, indicated increasing amounts of protection with increasing dosage However, larger doses would involve the concurrent administration of proportionately greater amounts of fluid, since the 15% preparation is the most concentrated currently available A dosage was chosen which offered significant protection but did not involve the administration of clinically intolerable amounts of fluid

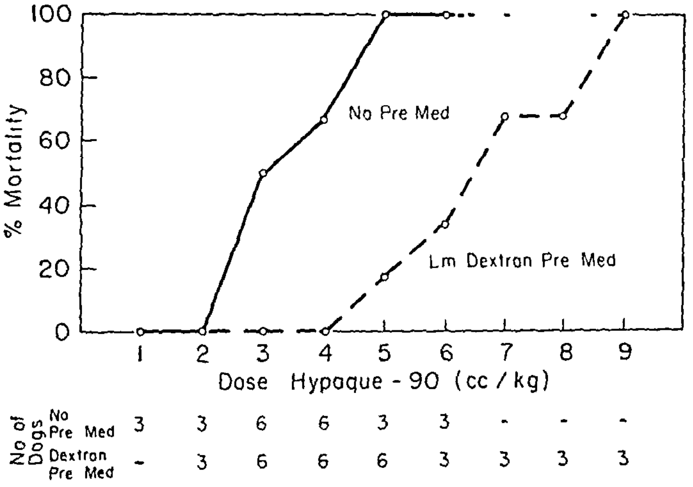

Fig 1 —Correlation between dose of 90% diatrizoate sodium solution and mortality in control animals and those pretreated with low molecular weight dextran

All of the dogs were observed until death or for 20 minutes Previous work had demonstrated that a return to stable vital signs within 20 minutes of injection was routinely followed by survival All surviving animals were killed with the exception of one dog in each dose-level group in both the control and pretreated groups These animals were observed for 48 to 72 hours and killed for gross and microscopic study

In an additional group of six animals, respiratory studies were carried out Both the aortic and pulmonary artery pressures were monitored with catheters introduced via the femoral artery and jugular vein The rate, rhythm, and depth of respiration, as well as the oxygen consumption, were recorded on a Benedict-Roth metabolator

Gross and Microscopic Findings in Thirty-Three Dogs Premedicated with Low-Molecular-Weight Dextran and Given Intravenous Injections of Diatrizoate Sodium*

Dog No	Dosage 90% Diatrizoate Sodium Solution, Cc /Kg of Body Weight	Pathology†				
		Lungs		Congestion of Liver	Congestion of Spleen	Distal Tubular Dilatation of Kidney
		Hemorrhage	Capillary Engorgement			
1	2	—	Mild	—	—	+
3		—	Moderate	—	—	+
4	3	Mild	—	—	—	+
6		—	—	—	+	+
7		—	—	—	+	+
8		—	—	—	—	+
9		—	—	—	—	+
10	4	Moderate	—	—	—	+
11		—	—	—	—	+
13		Mild	Mild	—	—	+
14		Mild	Mild	—	+	+
15		Moderate	—	—	—	—
16	5	Mild	Moderate	—	—	—
17		—	Moderate	—	+	+
18		Moderate	Severe	—	—	—
19		Moderate	Severe	—	—	—
20		Mild	Moderate	—	—	+
21		—	Moderate	—	—	—
22	6	Moderate	Moderate	—	—	+
23‡		Moderate	Severe	+	—	+
24		—	Minimum	—	—	+
25	7	—	Severe	—	—	+
26		—	Severe	+	—	+
28	8	Mild	—	—	—	+
29		—	Severe	+	—	—
30		—	Severe	—	—	—
31	9	Moderate	Moderate	—	—	+
32		—	Severe	—	—	—
33		Moderate	Severe	—	—	+

* All dogs showed normal heart intestine and pancreas Dogs No 2 no 5, no 12 and no 27 given 2,3,4 7 cc of 90% diatrizoate sodium solution per kilogram of body weight respectively showed no pathology

† Plus sign (+) indicates that symptom is present and minus sign (—) that it is absent

‡ This dog also showed a minimum of pulmonary edema

Results

Mortality—The effect of pretreatment with low-molecular-weight dextran upon the acute mortality after the rapid intravenous administration of 90% diatrizoate sodium solution is indicated in fig 1 The marked differences in mortality in animals receiving doses of 3, 4, and 5 cc per kilogram of body weight are of particular interest Exploratory investigations of the effect of premedication with 5% dextrose in water alone and with dog plasma, in equal amounts, failed to equal or approach the protection seen after premedication with low-molecular-weight dextran In the pretreated animals, approximately twice the dose of 90% diatrizoate sodium solution may be administered before the LD_{50} and LD_{100} levels are reached

Pathology—The gross and microscopic pathology found after the rapid intravenous injection of 90% diatrizoate sodium solution in animals without pretreatment has been described[3 16 17] Essentially, these findings consist of diffuse pulmonary hemorrhage and edema, dilation of the right side of the heart, congestion of the liver, occasionally associated with central hepatic necrosis, and splenic engorgement

In general, the marked gross pulmonary hemorrhage and edema which was characteristic of the fatal cardiovascular reaction after the administration of 3 to 5 cc of diatrizoate sodium per kilogram of body weight in the untreated animals was absent in the pretreated animals, instead, there was a mild engorgement of the pulmonary capillary bed

Electrocardiographic Changes—Previous studies have indicated marked and consistent bradycardia, ischemic changes, and conduction defects which followed the intravenous administration of large doses of diatrizoate sodium[1] Similar changes were also seen when premedication with dextrose and water was studied (fig 3) However, in the animals pretreated with low-molecular-weight dextran, there was no change in the rate, rhythm, or conduction pattern of the electrocardiogram, with the exception of three animals receiving relatively large doses Minimal ischemic changes were frequently seen, but these reverted to normal within 60 seconds in all of the surviving animals The striking difference in electrocardiographic pattern between the control and pretreated animals is illustrated in fig 3 The atrial T-wave, ST-T segment changes, and conduction block commonly associated with large intravenous doses of diatrizoate sodium

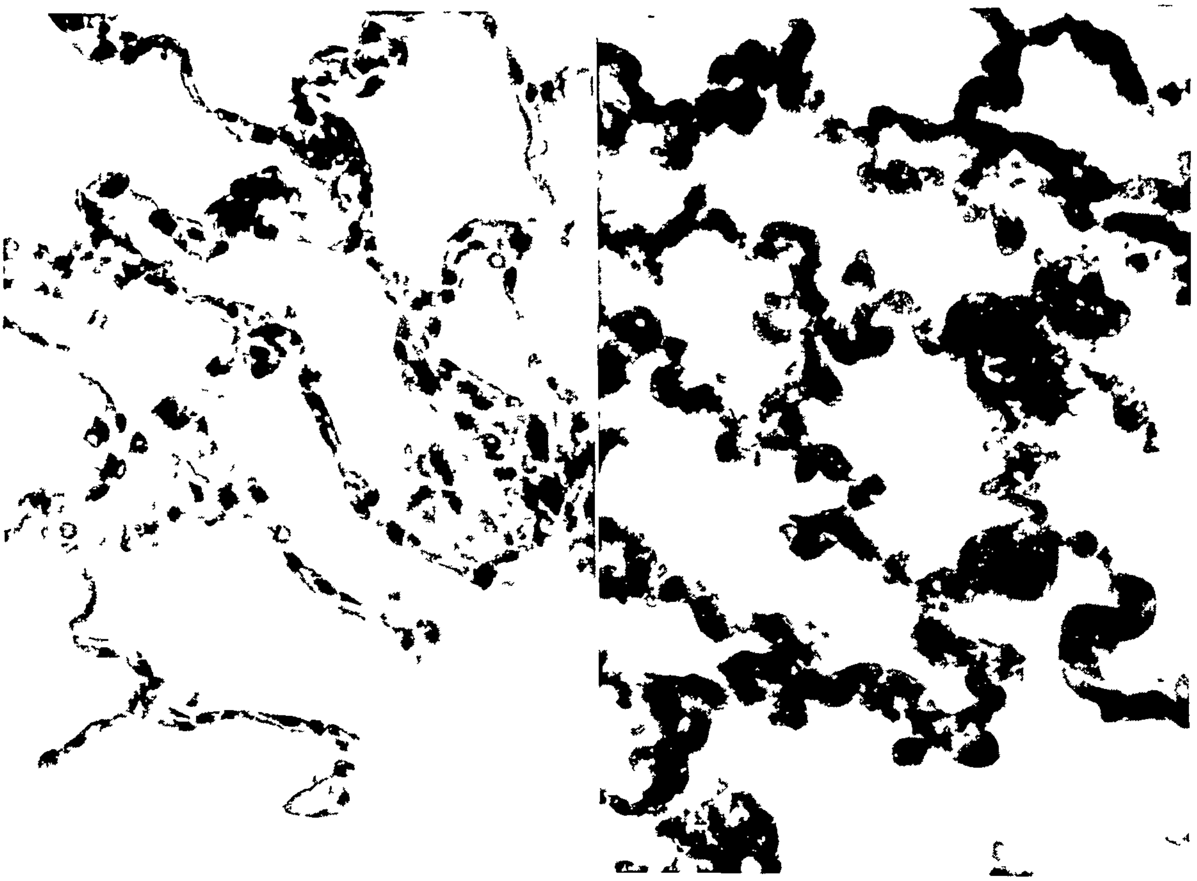

Fig 2—Histological sections of dogs lungs in dextran pretreated animals after administration of 90% diatrizoate sodium solution *Left*, capillaries appear normal after dose of 3 cc per kilogram of body weight *Right*, moderate capillary engorgement is seen throughout lung after dose of 9 cc per kilogram of body weight There is no evidence of pulmonary hemorrhage or edema in these sections

The gross and microscopic findings in the animals pretreated with low-molecular-weight dextran are strikingly decreased (see table) In these pretreated dogs, pulmonary pathology was limited to an engorgement of the pulmonary capillaries (fig 2) throughout the low and middle dose range of diatrizoate sodium, minimal and moderate amounts of hemorrhage were seen with the very high doses of diatrizoate sodium, and these were associated with hepatic congestion The kidneys of the pretreated animals were frequently engorged, and on microscopic sections diffuse distal tubular dilatation was a common finding These findings were considered typical of kidneys undergoing osmotic diuresis are not present where the animals have been premedicated with low-molecular-weight dextran

Blood Pressure—In the untreated animals which received diatrizoate sodium in doses equaling or exceeding 2 cc per kilogram of body weight, marked systemic hypotension usually developed This was also the case in those animals who were pretreated with dextrose and water In the surviving animals increased pulse pressure and tachycardia were noted

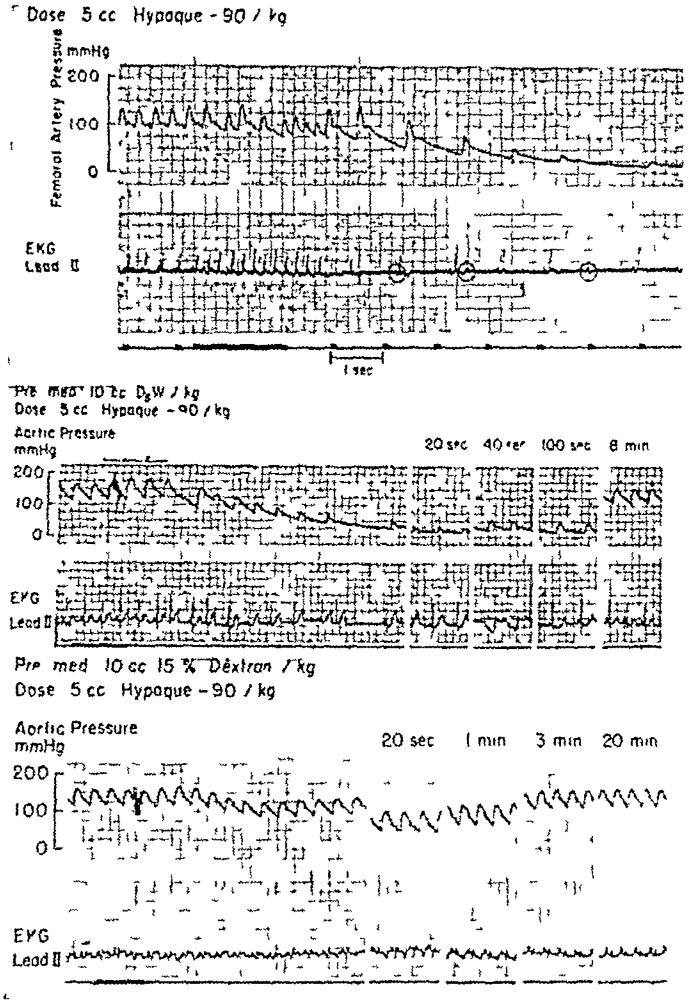

Fig 3—Blood pressure and electrocardiographic tracings after administration of 5 cc of 90% diatrizoate sodium solution per kilogram of body weight into dogs which had no premedication *(top)*, premedication with 10 cc per kilogram of body weight of 5% dextrose in water *(center)* and premedication with 10 cc per kilogram of body weight of 15% low molecular-weight dextran in 5% dextrose in water *(bottom)* Dog in bottom chart is no 16 in table

In the animals pretreated with low-molecular-weight dextran, absence of the initial hypotension in the lower dose ranges is striking (fig 4) With the administration of larger doses, there is a moderate degree of hypotension, without change in heart rate or rhythm, which reverts to normal rapidly (fig 3, fig 4, *bottom*, and fig 5, *bottom*)

Microcirculation Studies—Observations of the vessels of the bulbar conjunctiva with the aid of a dissecting microscope were performed in 12 of the dogs In the dogs who did not receive pretreatment, the development of red-blood-cell aggregations was noted within two or three minutes after the injection of diatrizoate sodium In general, these aggregations increased in number with increasing dosage They were accompanied by a slowing of flow, particularly in the small venules, and occasionally resulted in cessation of circulation in some of these vessels

In the animals which had been pretreated with low-molecular-weight dextran, the development of these red-blood-cell aggregates was either absent, minimized, or markedly diminished, depending upon the dosage of diatrizoate sodium employed

Respiratory Studies—Spirometric observations of the response of the animals to large doses of intravenously administered 90% diatrizoate sodium solution were made on six animals In the untreated animals, a period of apnea, which frequently lasts for 30 to 40 seconds and is followed by a rapid, shallow tachypnea, is routinely observed to follow the administration of 90% diatrizoate sodium solution in a dose of 3 cc per kilogram of body weight In the animals pretreated with dextran, this long period of apnea was replaced by a period of moderate tachypnea (fig 6) and the rapid return of normal respiratory rhythm

Comment

Observations by Hoppe[16, 17] and Read[21] indicate a consistent toxic response pattern after the intravenous administration of hypertonic materials, including the concentrated radiopaque media This experimental syndrome includes the rapid development of cardiac irregularities in rate, rhythm, and conduction mechanisms, electrocardiographic signs of myocardial ischemia, bradycardia, profound hypotension, apnea followed by rapid shallow tachypnea, pulmonary arterial hypertension, pulmonary hemorrhage, pulmonary edema, and death These findings correlate well with the typical syndrome of clinical reactions which have been des-

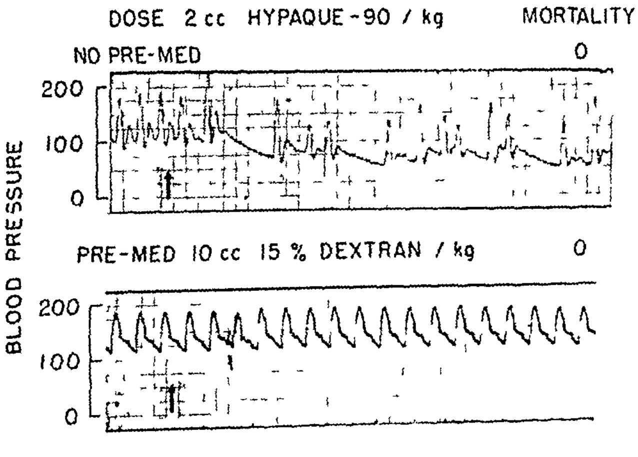

Fig 4—Comparative typical blood pressure tracings in two dogs receiving 90% diatrizoate sodium solution intravenously in doses of 2 cc per kilogram of body weight Marked aberration in blood pressure tracing of dog which received no pretreatment is in marked contrast to that of dog pretreated with low molecular weight dextran

cribed by a number of authors,[7, 12, 23, 25, 27] although the clinical syndrome frequently is seen after the administration of relatively smaller doses of these materials Since the observed physiological and pathological changes are parallel in the human being and in the experimental animal, it is not unlikely that the causative mechanisms are the same Further substantiation of this hypothesis is implied by the parallel observations of Read [24] and Sobin [27] of the development of red-blood-cell aggregation after the administration of radiopaque media

The observations of Fahraeus,[8, 10] Knisely,[18, 20] and Bigelow,[4, 15] and more recently those of Gelin,[13, 14] Thorsen,[28] Borgstrom,[5] and their associates, indicate that intravascular aggregation of cells commonly occurs after various forms of injury and that it is usually accompanied by an increase in erythrocyte sedimentation rate, which is a general reflection of the decreased suspension stability of the blood Thorsen and Hint [28] observed a linear relationship between the colloid concentration and the erythrocyte sedimentation rate and observed profound effects of various dextran fractions upon the suspension stability of blood They noted that dextran fractions of high molecular weight (100,000 to 300,000) caused the rapid development of red-blood-cell aggregates, an increase in the erythrocyte sedimentation rate, and a decrease in the circulating hematocrit value The infusion of low-molecular-weight dextran prevented or reversed these changes Other factors which may also be involved in the development of red-blood-cell aggregation include antigen-antibody reactions, the conversion of fibrinogen into fibrin, and stasis Further studies in vivo by Gelin confirmed the findings of Thorsen and Hint and indicate their importance after trauma

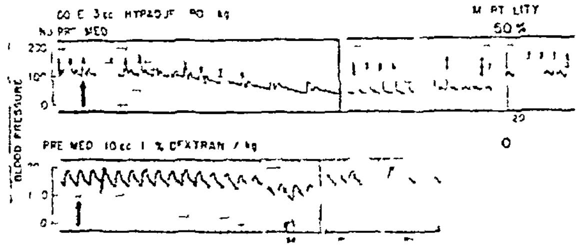

Fig 5—Comparative blood pressure tracings of dogs receiving 90% diatrizoate sodium solution in doses of 3 cc per kilogram of body weight *Top*, in dog which did not receive pretreatment, rapid development of profound bradycardia and hypotension is noted, with later development of increase in pulse pressure and tachycardia Mortality at this dose was 50% in untreated animals *Bottom*, in animals premedicated with low molecular weight dextran, there was no observable change in rate Relatively mild and transient period of hypotension and rapid recovery ensued There was no mortality in treated animals at this dose level

The profound effect of low-molecular-weight dextran in preventing the development of red-blood-cell aggregation, which was originally described by the Swedish investigators in relation to trauma, was confirmed in recent works by Long and Lillehei [22] with regard to the effects of prolonged extracorporeal circulation In their experiments, the development of red-blood-cell aggregation was noted approximately one hour after the onset of cardiopulmonary bypass and was completely reversed or prevented by the administration of low-molecular-weight dextran

The effect of premedication with low-molecular-weight dextran on the mortality and toxicity that occurs after the rapid intravenous administration of diatrizoate sodium is striking The maximum nonlethal dose of diatrizoate sodium is increased from 2 to 4 cc per kilogram of body weight, and the LD$_{50}$ is increased from 3.0 to approximately 6.5 cc per kilogram of body weight The typical pulmonary findings of hemorrhage and edema associated with large intravenously administered doses of diatrizoate sodium are absent or are replaced by a moderate amount of pulmonary capillary engorgement Profound electrocardiographic changes of rate, rhythm, conduction pattern, and ischemia, which are routine in untreated animals, are essentially absent With pretreatment, the bradycardia and hypotension are replaced by a normal rate, rhythm, and blood pressure Observations of the microcirculation of the bulbar conjunctiva indicate that red-blood-cell aggregates, which are seen after administration of diatrizoate sodium, are absent or markedly diminished in animals which are

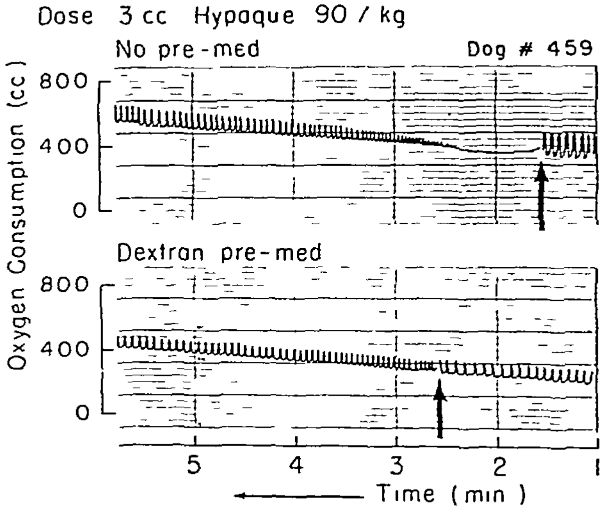

Fig 6—Spirometric tracings in dog after administration of two doses of 3 cc per kilogram of body weight When dog was untreated, prolonged period of apnea was noted followed by a rapid shallow tachypnea After administration of low molecular weight dextran, subsequent injection of same amount of 90% diatrizoate sodium solution resulted in mild tachypnea

pretreated with low-molecular-weight dextran Instead of the apnea and tachypnea which are characteristically seen after administration of diatrizoate sodium, a mild tachypnea is present While the precise mechanism responsible for the protective action of this material is still unknown, it appears to be due to a maintenance of the suspension stability of the blood and the prevention of red-blood-cell aggregation

These observations may be of considerable value in protecting patients who are to undergo any of the various angiographic procedures, particularly those in which large doses of concentrated radiopaque materials are administered In addition, it is conceivable that the protection offered by premedication with low-molecular-weight dextran may permit the safe use of larger doses of these materials than has heretofore been advisable

Summary

The experimental syndrome of acute diatrizoate sodium toxicity, which includes bradycardia, hypotension, pulmonary hemorrhage and edema, and myocardial conduction defects and ischemia, is strikingly modified by premedication with low-molecular-weight dextran, as seen in a series of experiments on animals This protective action appears to be related to maintenance of the suspension stability of the blood and prevention of the formation of red-blood-cell aggregates These findings may be of clinical value in protecting patients who are to undergo various angiographic procedures and in permitting the safe utilization of larger doses of concentrated radiopaque media In addition, it is hoped that these findings will aid in the final elucidation of the toxic process which occurs after the administration of diatrizoate sodium

These studies were supported in part by grants from the National Heart Institute, United States Public Health Service

The diatrizoate sodium used in this study was supplied as Hypaque-90% by Winthrop Laboratories, New York City, the low-molecular-weight dextron was supplied by Pharmacia Laboratories, Inc, New York City, and the stainless steel syringe and hand-lever injector were manufactured by the Elema-Schonander Co, Stockholm

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Medical Education in the United States and Canada

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Annual Report

Acknowledgement

The 60th Annual Report on Medical Education in the United States and Canada is presented by the Council on Medical Education and Hospitals of the American Medical Association in response to its long-standing charge, "To make an Annual Report to the House of Delegates on the existing conditions of medical education" This publication presents information primarily related to medical schools and their faculties and students Other aspects of the total span of medical education are portrayed in separate reports [1] [2]

The statistical data presented here were collected for the most part, from medical schools through a questionnaire prepared jointly by the staffs of the Council on Medical Education and Hospitals and the Association of American Medical Colleges

The Council on Medical Education and Hospitals is pleased to express appreciation for the American Medical Association to the individual medical schools, the Association of American Medical Colleges, the Association of Canadian Medical Colleges, governmental agencies, and other organizations and individuals who provided the information that has made possible the preparation of the report

Medical Schools

Approved and Newly Developing Medical Schools

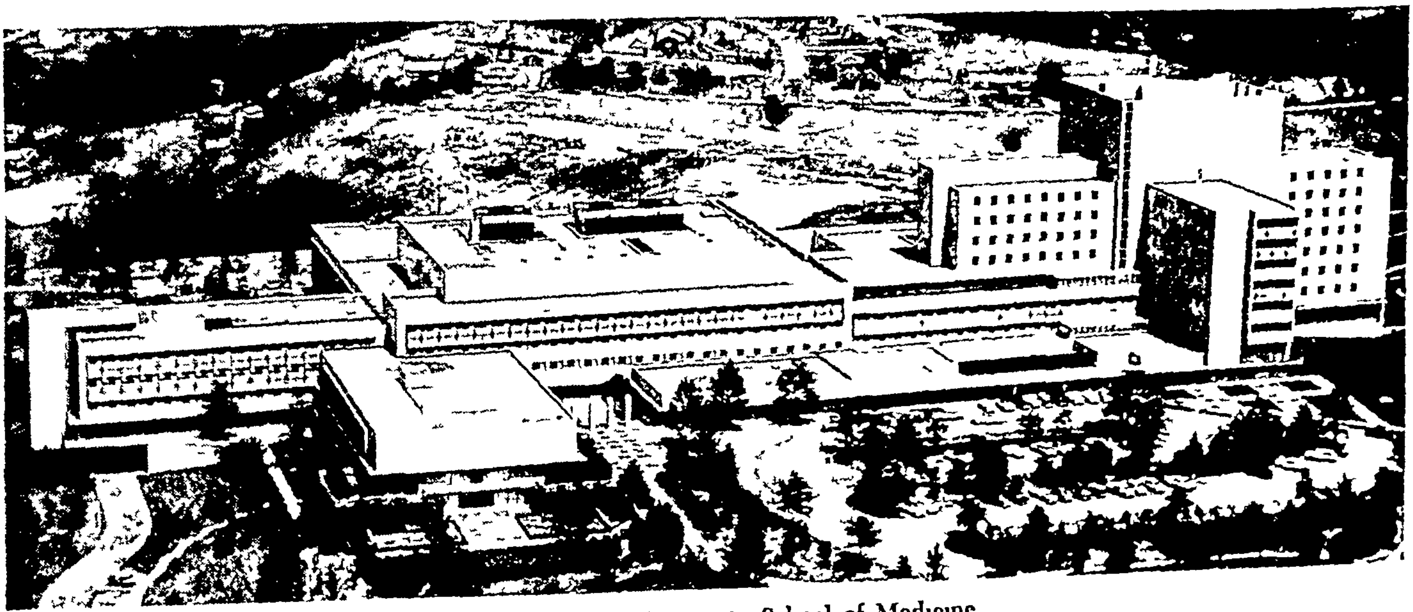
In the academic year 1959-1960 covered by this report, the University of Florida College of Medicine and Seton Hall College of Medicine and Dentistry graduated their first classes Both were granted full approval as four-year medical schools, increasing the number of such institutions in the United States to 81

West Virginia University School of Medicine is now in the process of expansion to a full four-year program It initiated its third-year teaching program in the fall of 1960 It will be eligible for approval as a four-year school in 1961-1962 and will be visited by the Liaison Committee on Medical Education [3] for that purpose just prior to the graduation of the first class In the interim, for accreditation purposes it is classified as an approved school of basic medical sciences When the transition is completed, there will remain three schools in that category

The University of Kentucky College of Medicine dedicated its new facilities and matriculated its first class in September, 1960 It is planned that the initial enrollment of 40 students will be expanded to 75 in the next few years This newly developing institution will be considered for provisional approval by the Liaison Committee prior to the end of its second year of operation It will be eligible for approval as a four-year school in 1963-1964

Table 1 lists by states the approved four-year medical schools and schools of basic medical sciences, showing type of ownership, year of organization, enrollment by class, and other basic data for each Table 2 portrays similar information for the 12 approved medical schools in Canada

Of the 85 approved medical *schools in the* United States (including schools of basic medical sciences but not including the University of Kentucky), 40



West Virginia University School of Medicine are publicly owned institutions and 45 are private Of the total first year class enrollment in 1959-1960, 49% was in public schools and 51% in private Forty seven per cent of the graduates were from public institutions and 53% from private

Study on Potential Expansion

In an effort to get reliable information on the potential expansion of medical schools, the Liaison Committee submitted a special inquiry to the medical schools regarding possible future expansion Specific efforts were made to assure that the answers represented the policy decision by responsible authorities of the institution The questionnaire dealt with opinions which were related to the maximum future expansion of the medical school The questionnaire was as follows

1 (*a*) With specific reference to the 1959-1960 *first-year class* and with your present faculty and facilities, what is the maximum number of students (including the number enrolled in the 1959 1960 year) you could have admitted to the first-year class had there been adequate numbers of qualified applicants?

1 (*a*) With specific reference to the 1959-1960 *third-year class* and with your present faculty and facilities what is the maximum number of transfer students (including those actually admitted in 1960) you could have admitted to the third-year class had there been adequate numbers of qualified students?

2 (*a*) Compatible with high quality education and the particular objectives of your school, and with the assumption that the necessary faculty personnel and facilities could be provided, what is the maximum number of *first-year students* which the ultimate authority of your institution and the executive faculty would agree to accept?

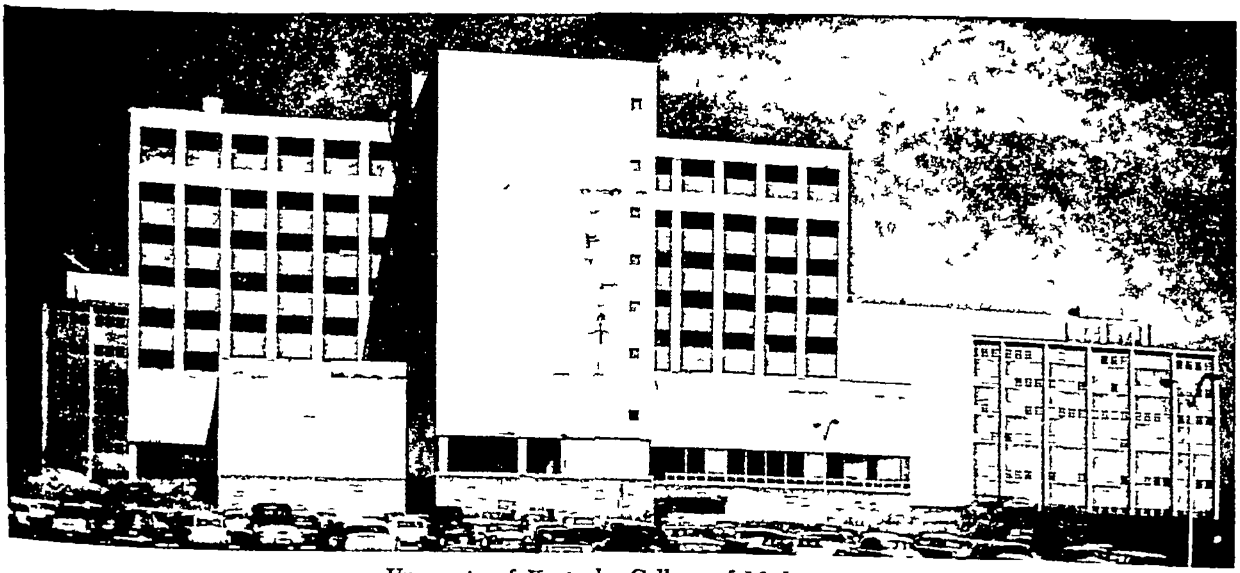
(*b*) Compatible with high quality education and the particular objectives of your school, and with the assumption that the necessary faculty personnel and facilities could be provided, what is the maximum number of *third-year students* which the ultimate authority of your institution and the executive faculty would agree to accept?

The summary data from these questionnaires are presented in Figure 1 (p 1430)

1959-1960 *first-year class* The total of answers to the first question presumably represents all the places available for first-year medical students in the 85 approved medical schools in the United States for the fall of 1959 Some adjustments were necessary In a few schools, actual enrollment for the first year exceeded the figure submitted in answer to question 1 (*a*) Since maximum capacity could, in one sense, be no less than present enrollment, two values for maximum capacity were computed

For an estimate of the degree to which schools were operating at capacity, an 'adjusted maximum capacity" was used, which was the total of the number of places available in the first-year classes, using either the maximum capacity [as stated in question 1 (*a*)] or the actual first-year enrollment, whichever was larger This figure is shown on Table 3 (p 1430) as 8,333 student positions Since the actual first-year enrollment of regular (excluding special and part-time) students was 8,118, the 85 schools operated in 1959-1960 at 97 4% of capacity If the 55 part-time and special students are included on the premise that they are in fact occupying positions in competition with regularly enrolled medical students, the school can be considered to be operating at 98 1% of capacity

For calculations relating to expansion of the first-year class, a slightly different set of values were



University of Kentucky College of Medicine

TABLE 1 —Approved Medical Schools and Schools of the Basic Medical Sciences in the United States

State	No		Ownership	Year Organized	Tuition Resident	Tuition Nonresident	Premedical Requirement by Year	Students by Classes 1959 1960 (Full time, Part time, and Special Students Included) 1st Yr	2nd Yr	3rd Yr	4th Yr	Total	Part time and Special Students	Graduates 7/1/59 to 6/30/60		
Ala	1	Medical College of Alabama, Birmingham	Pub	1859	650	1 050	3	80	71	76	73	300	2	71	Robert C Berson M D, Dean and Vice President, Med Affairs	1
Ark	2	University of Arkansas School of Medicine, Little Rock	Pub	1879	500	1,000	3	92	80	85	86	343	0	86	F Douglas Lawrason, M D, Dean and Provost	2
Calif	3	College of Medical Evangelists School of Medicine Loma Linda, Los Angeles	Pri	1909	1,250	1,250[1]	3	105	99	91	86	381	13	85	Walter E Macpherson, M D Dean	3
	4	University of California School of Medicine, Los Angeles	Pub	1951	386	736-	3	57	57	54	50	218	0	49	Stafford L Warren M D, Dean	4
	5	University of Southern California School of Medicine Los Angeles	Pri	1885	1,220	1,220[1]	3	69	70	69	64	272	0	64	Clayton G Loosli, M D, Dean	5
	6	Stanford University School of Medicine, Palo Alto	Pri	1908	1,005	1 005[1]	3	71	59	75	57	262	1	57	Robert H Alway, M D, Director and Dean	6
	7	University of California School of Medicine, San Francisco	Pub	1864	385	835[2]	3	101	101	77	79	358	0	79	John B deC Saunders, M D, Provost and Dean	7
Colo	8	University of Colorado School of Medicine, Denver	Pub	1883	655	1,055[2]	3	85	80	76	71	312	1	71	Robert J Glaser M D, Vice President and Dean	8
Conn	9	Yale University School of Medicine, New Haven	Pri	1812	1 405	1 405	3	80	81	70	72	308	3	72	Vernon W Lippard, M D, Dean	9
D C	10	Georgetown University School of Medicine, Washington	Pri	1851	1,260	1 260	3	113	97	92	102	404	0	102	Hugh H Hussey, M D, Dean	10
	11	George Washington University School of Medicine, Washington	Pri	1825	1 200	1,200	3	102	96	96	98	392	0	97	John L Parks, M D, Dean	11
	12	Howard University College of Medicine Washington	Pri	1868	592	592	3	105	96	81	73	355	10	69	Robert S Jason, M D, Dean	12
Fla	13	University of Miami School of Medicine, Coral Gables	Pri	1952	1 000	1,500	3	81	68	67	57	273	4	56	Homer F Marsh, Ph D, Dean	13
	14	University of Florida College of Medicine Gainesville	Pub	1956	600	1,200	4	49	46	42	40	177	0	40	George T Harrell M D Dean	14
Ga	15	Emory University School of Medicine, Emory University (P O)	Pri	1854	1 000	1 000	3	77	72	71	73	293	5	71	Arthur P Richardson, M D Dean	15
	16	Medical College of Georgia, Augusta	Pub	1828	600	—	3	102	91	86	86	365	3	88	Walter G Rice, M D Dean	16
Ill	17	Chicago Medical School	Pri	1912	1 267	1 267	4	73	64	64	66	267	0	65	John J Sheinin M D, President	17
	18	Northwestern University Medical School, Chicago	Pri	1859	1 250	1 250	3	130	126	131	133	520	3	132	Richard H Young M D Dean	18
	19	Stritch School of Medicine of Loyola University Chicago	Pri	1915	950	950	3	88	75	79	84	326	0	79	John F Sheehan M D Dean	19
	20	University of Chicago The School of Medicine	Pri	1927	1 110	1 110	3	73	74	77	75	299	0	75	Lowell T Coggeshall, M D, Dean, Div of Biological Sciences	20
	21	University of Illinois College of Medicine, Chicago	Pub	1881	343	763	3	200	184	177	170	731	0	170	Granville A Bennett M D Dean	21
Ind	22	Indiana University School of Medicine Indianapolis	Pub	1903	430	750	4	182	142	144	133	601	1	132	John D Van Nuys M D Dean	22
Iowa	23	State University of Iowa College of Medicine Iowa City	Pub	1850	400	800	3	120	109	102	105	436	7	103	Norman B Nelson M D, Dean	23
Kans	24	University of Kansas School of Medicine Lawrence Kansas City	Pub	1905	475	925	4	101	95	95	102	393	1	98	C Arden Miller, M D, Dean	24
Ky	25	University of Louisville School of Medicine	Pri	1837	1,025	1,525	3	99	98	87	91	375	2	89	J Murray Kinsman, M D, Dean	25
La	26	Louisiana State University School of Medicine, New Orleans	Pub	1931	120	520	3	128	111	103	95	437	5	95	William W Frye, M D, Vice President and Dean	26
	27	Tulane University School of Medicine New Orleans	Pri	1834	1,110	1 110	3	132	129	120	118	499	2	118	Maxwell E Lapham M D, Dean	27
Md	28	Johns Hopkins University School of Medicine Baltimore	Pri	1893	1 280	1 280	3	78	76	68	64	286	1	63	Thomas B Turner M D Dean	28
	29	University of Maryland School of Medicine & College of Physicians and Surgeons Baltimore	Pub	1807	786	936	3	100	98	87	84	369	2	84	William S Stone M D Dean	29
Mass	30	Boston University School of Medicine	Pri	1873	1 300	1 300	4	72	71	67	71	281	2	71	Lamar Soutter M D Director and Dean	30
	31	Harvard Medical School Boston	Pri	1783	1 500	1 500	2	116	111	137	141	505	0	143	George Packer Berry, M D Dean	31
	32	Tufts University School of Medicine, Boston	Pri	1893	1 215	1 215	3	114	111	110	103	438	0	103	Joseph M Hayman Jr, M D, Dean	32
Mich	33	University of Michigan Medical School Ann Arbor	Pub	1850	500	980	3	196	168	177	179	720	3	177	William N Hubbard M D Dean	33
	34	Wayne State University College of Medicine Detroit	Pub	1885	552	981	3	126	114	72	63	375	1	63	Gordon H Scott, Ph D Dean	34
Minn	35	University of Minnesota Medical School Minneapolis	Pub	1888	505	945	3	141	130	121	122	514	7	122	Robert B Howard, M D Dean	35
Miss	36	University of Mississippi School of Medicine, Jackson	Pub	1903	600	825	3	80	69	61	64	274	0	63	David S Pankratz M D Dean and Director	36
Mo	37	University of Missouri School of Medicine Columbia	Pub	1840	465	715	3	75	76	62	59	272	4	59	Vernon E Wilson M D, Dean	37
	38	Saint Louis University School of Medicine	Pri	1903	1,000	1 000	3	113	113	97	97	420	11	97	James W Colbert Jr M D Dean	38
	39	Washington University School of Medicine St Louis	Pri	1899	924	924	3	86	85	87	85	343	1	85	Edward W Dempsey M D Dean	39
Neb	40	Creighton University School of Medicine Omaha	Pri	1892	1 012	1 012	3	77	73	56	65	271	1	65	Richard L Egan M D Dean	40
	41	University of Nebraska College of Medicine Omaha	Pub	1881	525	765	3	85	73	75	81	314	1	80	James P Tollman M D Dean	41
N J	42	Seton Hall College of Medicine and Dentistry Jersey City	Pri	1956	950	950	3	81	74	73	71	299	0	71	James E McCormack M D Dean	42
N Y	43	Albany Medical College of Union University	Pri	1839	1 292	1 292	3	63	63	58	54	238	1	54	Harold C Wiggers Ph D Dean	43
	44	University of Buffalo School of Medicine	Pri	1846	1 200	1 200	3	83	79	74	63	299	4	63	Ernest Witebsky M D Dean	44

	45	Albert Einstein College of Medicine of Yeshiva University New York City	Pri	1955	1 050	1 050	4	96	94	89	90	369	0	90	Marcus D Kogel M D Dean	45
	46	Columbia University College of Physicians and Surgeons New York City	Pri	1767	1 488	1 488	3	120	118	118	116	472	0	116	H Houston Merritt M D Dean	46
	47	Cornell University Medical College New York City	Pri	1898	1 425	1 425	4	84	83	83	86	336	0	86	John E Deitrick M D Dean	47
	48	New York Medical College Flower & Fifth Avenue Hospitals New York City	Pri	1860	1 200	1 200	4	128	128	122	112	490	0	112	Ralph E Snyder M D President and Dean	48
	49	New York University College of Medicine New York City	Pri	1841	1 367	1 367	3	133	130	126	128	517	1	128	S Bernard Wortis M D Dean	49
	50	State University of New York Downstate Medical Center New York City	Pub	1860	715	715	3	156	143	138	131	568	-	131	Robert A Moore M D President and Dean	50
	51	University of Rochester School of Medicine and Dentistry	Pri	1920	1 275	1 275	3	72	68	77	59	276	1	59	Donald G Anderson M D Dean	51
	52	State University of New York Upstate Medical Center Syracuse	Pub	1834	717	717	3	84	71	70	75	302	0	73	Carlyle Jacobsen Ph D Dean and President Medical Center	52
N C	53	University of North Carolina School of Medicine Chapel Hill	Pub	1879	600	1,200	3	69	64	64	69	266	2	69	W Reece Berryhill M D Dean	53
	54	Duke University School of Medicine Durham	Pri	1930	1 200	1 200	3	76	78	80	78	312	3	71	Barnes Woodhall M D Dean	54
	55	Bowman Gray School of Medicine of Wake Forest College Winston Salem	Pri	1902	900	900	3	55	51	54	54	214	0	53	Coy C Carpenter M D Dean	55
Ohio	56	University of Cincinnati College of Medicine	Pub	1819	750	950	3	94	86	84	88	352	0	87	Stanley E Dorst M D Dean	56
	57	Western Reserve University School of Medicine Cleveland	Pri	1843	1 100	1 100	3	88	79	77	88	332	5	85	Douglas D Bond M D Dean	57
	58	Ohio State University College of Medicine Columbus	Pub	1914	660	1 035	4	150	151	131	136	568	0	137	Charles A Doan M D Dean	58
Okla	59	University of Oklahoma School of Medicine Oklahoma City	Pub	1900	500	1 000	3	101	91	87	85	364	0	85	Mark R Everett Ph D Dean	59
Ore	60	University of Oregon Medical School Portland	Pub	1887	618	921[2]	3	79	75	73	77	304	8	72	D W E Baird M D Dean	60
Pa	61	Hahnemann Medical College and Hospital of Philadelphia	Pri	1848	982	982	3	111	89	96	90	386	0	90	Charles S Cameron M D Dean	61
	62	Jefferson Medical College of Philadelphia	Pri	1825	994	994	3	177	150	170	162	659	0	163	William A Sodeman M D Dean	62
	63	Temple University School of Medicine Philadelphia	Pri	1901	950	950	4	137	130	128	126	521	0	125	Robert M Bucher M D Dean	63
	64	University of Pennsylvania School of Medicine Philadelphia	Pri	1765	1 200	1 200	4	129	127	133	132	521	1	131	John McK Mitchell M D Dean	64
	65	Woman's Medical College of Pennsylvania Philadelphia	Pri	1850	1 080	1 080	3	51	52	40	42	185	1	40	Marion Fay Ph D Dean and President	65
	66	University of Pittsburgh School of Medicine	Pri	1883	1 316	1 316	3	108	80	94	97	379	0	97	Francis S Cheever M D Dean	66
Puerto Rico	67	University of Puerto Rico School of Medicine San Juan	Pub	1949	558	558	3	52	51	50	42	195	0	42	Jose R Vivas M D Dean	67
S C	68	Medical College of South Carolina Charleston	Pub	1823	602	1 520[3]	3	80	73	74	72	299	0	70	John I Cuttino M D Dean	68
Tenn	69	University of Tennessee College of Medicine Memphis	Pub	1851	687	1 062	3	203	193	177	187	760	0	187	Maston Kennerly Callison M D Dean	69
	70	Meharry Medical College Nashville	Pri	1876	869	869	3	79	61	58	66	264	4	64	Daniel T Rolfe M D Dean	70
	71	Vanderbilt University School of Medicine Nashville	Pri	1875	1 210	1 210	4	52	53	52	48	205	1	48	John W Patterson M D Dean	71
Tex	72	University of Texas Southwestern Medical School Dallas	Pub	1943	360	360	4	104	92	103	101	400	0	101	Atticus J Gill M D Dean	72
	73	University of Texas Medical Branch Galveston	Pub	1887	360	800	4	148	111	108	140	507	0	140	Kenneth M Earle M D Exec Director Med Branch and Dean	73
	74	Baylor University College of Medicine Houston	Pri	1900	997	997	3	84	92	85	69	330	20	67	Stanley W Olson M D Dean	74
Utah	75	University of Utah College of Medicine Salt Lake City	Pub	1905	604	855[2]	3	56	53	50	44	203	1	44	Philip B Price M D Dean	75
Vt	76	University of Vermont College of Medicine Burlington	Pub	1822	550	1 500	4	52	45	45	42	184	6	42	George A Wolf M D Dean	76
Va	77	University of Virginia School of Medicine Charlottesville	Pub	1825	574	1 074	3	76	68	77	66	287	0	65	Thomas H Hunter M D Dean	77
	78	Medical College of Virginia Richmond	Pub	1838	671	1 021	3	84	75	97	95	351	0	95	William F Maloney M D Dean	78
Wash	79	University of Washington School of Medicine Seattle	Pub	1945	435	768[2]	3	78	66	72	72	288	2	72	George N Aagaard M D Dean	79
Wis	80	University of Wisconsin Medical School Madison	Pub	1907	420	800	3	58	93	88	73	312	18	73	John Z Bowers M D Dean	80
	81	Marquette University School of Medicine Milwaukee	Pri	1913	1 050	1 050	3	104	104	97	98	403	9	89	John S Hirschboeck M D Dean	81
		Totals						8 010	7 429	7 214	7 134	29,793	102	7 081		
		Approved Schools of Basic Medical Sciences														
N H	1	Dartmouth Medical School Hanover	Pri	1797	1 400	1 400	3	24	24			48	0		S Marsh Tenney M D Dean	1
N D	2	University of North Dakota School of Medicine Grand Forks	Pub	1905	210	480	3	44	37			81	0		Theodore H Harwood M D Dean	2
S D	3	State University of South Dakota School of Medicine Vermillion	Pub	1907	411	761	3	44	36			80	0		Walter L Hard Ph D Dean	3
W Va	4	West Virginia University School of Medicine Morgantown[4]	Pub	1902	316	752	3	45	37			82	1		Edward J Van Liere M D Dean	4
		School Developing New Program														
Ky	1	University of Kentucky School of Medicine Lexington[5]	Pub	1954	500	950	3								William R Willard M D, Dean	1
		Totals						157	134			291	1			
		Grand Totals						8 173	7 563	7 214	7 134	30 084	103	7 081		

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[1] Residents of Alaska Arizona, Hawaii Idaho, Montana Nevada, New Mexico and Wyoming who enroll under the Western Interstate Commission for Higher Education s student exchange program can receive financial assistance from their state

[2] Residents of Alaska Arizona Hawaii Idaho Montana Nevada, New Mexico and Wyoming who enroll under the Western Interstate Commission for Higher Education s student exchange program will pay the standard resident tuition

[3] For upperclassmen no non resident 1st year students

[4] Developing four year program Third year students enrolled for 1960 61 session

[5] First year students enrolled for 1960 61 session

TABLE 2 —Approved

Province		Approved Medical Schools	Year Organized	Tuition		Premedical Requirement*
				Resident	Nonresident	
Alta	1	University of Alberta Faculty of Medicine, Edmonton	1913	$393	$393	3
B C	2	University of British Columbia School of Medicine, Vancouver	1949	545	645	3
Man	3	University of Manitoba Faculty of Medicine, Winnipeg	1883	531	531	3
N S	4	Dalhousie University Faculty of Medicine, Halifax	1867	591	531	3
Ont	5	Queen's University Faculty of Medicine Kingston	1854	440	440	1[1]
	6	University of Western Ontario Faculty of Medicine London	1881	625	625	3
	7	University of Ottawa Faculty of Medicine Ottawa	1945	559	859	3
	8	University of Toronto Faculty of Medicine, Toronto	1843	654	654	4
Que	9	McGill University Faculty of Medicine Montreal	1828	600	600	3
	10	University of Montreal Faculty of Medicine, Montreal	1843	545	650	Degree
	11	Laval University Faculty of Medicine Quebec	1852	520	520	Degree
Sask	12	University of Saskatchewan College of Medicine Saskatoon	1926	475	475	3
		Totals				

* Number of premedical years required after Junior matriculation in high school for admission to medical school

[1] In the case of Queen's and Ottawa where years of premedical work is under the Faculty of Medicine in addition to the four years of medical school itself the figure given admits to the first premedical college year of the faculty To enter the four year medical school program directly two years of college are needed in addition to the figure given

used, which took into account the fact that a few schools recognized present enrollment as too large for satisfactory education and that it should be reduced This total uses capacity figures submitted by the schools, even if less than active enrollment It is identified in Table 3 as "Maximum Stated Capacity" and is used as the base for subsequent discussions of the first-year capacity

While the over-all figures indicate close approximation of actual enrollment to the actual capacity of the school, examination of the data by school yields additional pertinent information Of the 85 schools, 19 indicated that they had unfilled positions, 33 that they had enrolled the precise number of students that they considered as maximum, and the remaining 33 had enrolled more students than their stated maximum The majority of the differences, however, either below or above the "stated maximum capacity" involved one or two students per school indicating difficulty in matching exactly the number of acceptances with the number of places

Of the 129 places in 19 schools who reported unfilled positions, 89 were in five schools Four public schools reported 28, 15, 15, and 13 places One private school reported 18 unfilled positions In each instance it seems likely that a restrictive admissions policy is responsible for the inability to fill these positions

Most of the 33 schools reporting an enrollment in excess of "stated maximum" indicated differences of only one or two students Three schools feel apparently that their present enrollment is well in excess of capacity These three schools accounted for 58% of the entire number of excess students In one state-supported school the first-year enrollment was 66 in excess of the school's stated maximum Two privately-supported schools reported 11 and seven respectively It seems reasonable to assume that this record represents a feeling that the first-year enrollment exceeds the desirable maximum for those schools and a reduction in enrollment is wanted

The questionnaire was designed to provide an estimate of the maximum possible expansion that could be expected with the schools currently in operation if adequate faculty, facilities, and qualified students were available The schools were provided opportunity to set a limit on the number of students beyond which they would not willingly expand, but at which they could still provide high quality medical education Presumably, this figure is an estimate of the maximum that can be expected of existing schools, and any additional expansion should come from schools not in existence now Whenever provided, the figures given by the schools were accepted In a few instances it was necessary to use actual enrollment figures for the 1959-1960 maximum In this case, when the actual enrollment was in excess of the stated maximum, the latter figure was used on the assumption that the "stated maximum" figure represented the level at which the faculty felt they could provide satisfactory education, and that the quality of education was being endangered by excessive enrollment With these adjustments, the total of the stated present maximum enrollment for 85 schools is 8,188 The acceptable maximum first-year enrollment in the same schools if adequate faculty, facilities, and qualified students were available, that is, under ideal circumstances, was 9,894, an increase of 1,706 students (22%)

The Surgeon General's Consultant Group on Medical Education (The "Bane" Committee) estimates the need for about 12,000 first-year places by 1971[4] Thus, even if the medical schools were able to expand to capacity and to obtain adequate faculty, facilities, and qualified students in the next 11 years, the United States would still be deficient about 2,100 places for first-year medical students or the equivalent of 21 medical schools with an average entering class of 100

Medical Schools in Canada

1st Pre medical Year	2nd Pre medical Year	1st Year	2nd Year	3rd Year	4th Year	Required Intern Year	Total	Part Time and Special Students	Graduates 7/1/59 to 6/30/60		
		58	51	51	55		213		50	Walter C Mackenzie M D Dean	1
		58	54	46	56		214		56	John F McCreary M D Dean	2
		51	41	55	54		201		54	Lennox G Bell M D Dean	3
		62	51	55	49	50	217[3]		50	C B Stewart M D Dean	4
59	49	60	63	49	53		225[3]		52	G H Ettinger M D Dean	5
		60	62	58	54		234		54	James B Collip M D Dean	6
18	35	59	45	54	52		211[3]	1	43	Jean-Jacques Lussier M D Dean	7
		155	157	148	140		600		138	J A MacFarlane M D Dean	8
		109	104	107	94		414	2	95	Lloyd G Stevenson M D Dean	9
		110	111	98	111		430		101	Wilbrod Bonin M D Dean	10
		120	115	115	108	141	458[3]		141	Jean Baptiste Jobin M D Dean	11
		40	30	27	29		126		29	J Wendell Macleod M D Dean	12
77	81	946	852	863	858	191	3,493[3]	3	863		

[2] A very definite preference is given to those who have baccalaureate degrees

[3] Intern and premedical figures not included

An unsuccessful attempt was made in this questionnaire to obtain data on which an estimate could be made of the present third-year capacity for absorption of transfer students It was necessary in many instances to substitute numbers of *accepted* transfer students for the desired data The 953 places that were tabulated as maximum capacity for transfer students in the third year is probably less than maximum, and indicates that one of the most readily available means by which the number of medical students trained could be expanded would be by the expansion and formation of two-year schools Since the three existing two-year schools (West Virginia University is initiating clinical training in 1960 1961) have a present capacity of 112 with potential expansion to 188, it is apparent that the clinical facilities now in existence for training third- and fourth-year students are capable of handling about five times the present demand for advanced undergraduate medical training

The details of the potential expansion of first-year classes are shown in Figure 2 (p 1431) For most schools the expected expansion is modest with a median for the 85 schools of 15 additional students (18 5%) Private and public schools are separately identified on this chart, but there seem to be no significant differences between them as separate groups Median values are essentially the same for both groups

Similar data for the possible expansion of the third year classes are presented in Table 3 and Figure 3 (p 1431) Here the expansion shows a much wider range

The 1959-1960 third-year enrollment, excluding special students, was 7,182 The maximum enrollment in this class acceptable to the schools was 10,009, an increase of 2,827 places (39%) This represents a considerably larger potential expansion in the clinical than the basic science years

It should be noted that this comparison is not identical with the foregoing first-year data in which maximum future expansion is compared with present maximum capacity The third-year comparison is between maximum future expansion and 1959-1960 class enrollment To some extent the numbers depicted as possible expansion include capacities now in existence but unused because of lack of qualified students seeking admission for advanced standing

Although the differences are not striking, it appears that state-supported schools are willing to project more extensive expansion than private schools in the clinical years Possibly this may be because they feel more pressure forcing them to expand their facilities for training, or because they can foresee more extensive clinical facilities under the control of the medical school Medical schools indicate a median acceptable expansion of 27 additional places in the third year This would represent an increase of 32% in the present third-year enrollment Considered as a group, the increase for state schools has a median of 32, while the median for the private schools is 23 places There are many possible interpretations of these data It should be emphasized that these totals are presented as an estimate of maximum expansion that would be acceptable to the administration and faculties of the various schools under ideal circumstances These circumstances may be approached, but are not likely to be fully attained Even reasonable approximation will require major changes in medical school financing and extensive and expensive facilities that will need to be constructed Medical school faculties will have to be greatly augmented Also, the available supply of well trained and well qualified students with enough financial backing from either private or public funds to enable them to complete their medical training will have to be increased considerably Finally, in addition to this necessary expansion of existing schools, it will still be necessary to establish several new medical schools in the next decade

Construction of Facilities

Table 4 (p 1432) presents estimates of the costs of construction completed at 34 United States' schools during 1959-1960, the costs of construction initiated by 30 schools and estimates of construction planned for 1960-1961 by 42 schools for which funds have already been committed Where possible, these estimates of costs have been sub-classified according to the stated purpose of the construction In those instances in which a single medical school has had separate projects in more than one of the classifications noted or in which the project is for another purpose (e g, student housing or heating plants), the estimates of costs involved appear as "not categorized"

The reader is cautioned not to interpret the sub-classifications too literally since there is clearly overlapping of the purposes to be served by the facilities Although teaching is not usually a direct and major purpose of those facilities listed under research, in most instances teaching of medical students will take place in them Most research facilities will serve a major teaching function for advanced-degree students in the basic medical sciences Only in unusual instances would hospital facilities constructed under medical-school auspices not serve the additional purposes of teaching and research

TABLE 3 —*Current 1st and 3rd Year Enrollment in 85 U S Schools and Maximum Acceptable Expansion If Necessary Faculty, Facilities, and Qualified Students Available*

	U S
1 First year enrollment, 1959 1960	8,131 (98% of adjusted maximum)
2 Maximum stated capacity, first year 1959 1960*	8,188
3 Adjusted maximum capacity, first year 1959 1960†	8 333
4 Maximum first year capacity acceptable under "ideal" conditions	9 894 (21% increase over maximum "stated" capacity)
5 Third year enrollment, 1959 1960	7,182
6 Maximum third year enrollment acceptable under "ideal" conditions*	10,009 (39% increase)

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* Using actual enrollment in rare instances where specific data not supplied

† Using value provided as present maximum or actual enrollment whichever was larger

When the data in Table 4 are compared with similar data reported a year ago, a significant increase in construction is apparent For estimates of costs of facilities completed there was an increase of 35%, for cost estimates of facilities initiated the increase was 25%, funds committed for construction planned were more than double (140%) those committed the previous year

Information pertinent to construction of facilities in Canada is also presented in the table Because of the few items involved, no effort was made at sub-classification

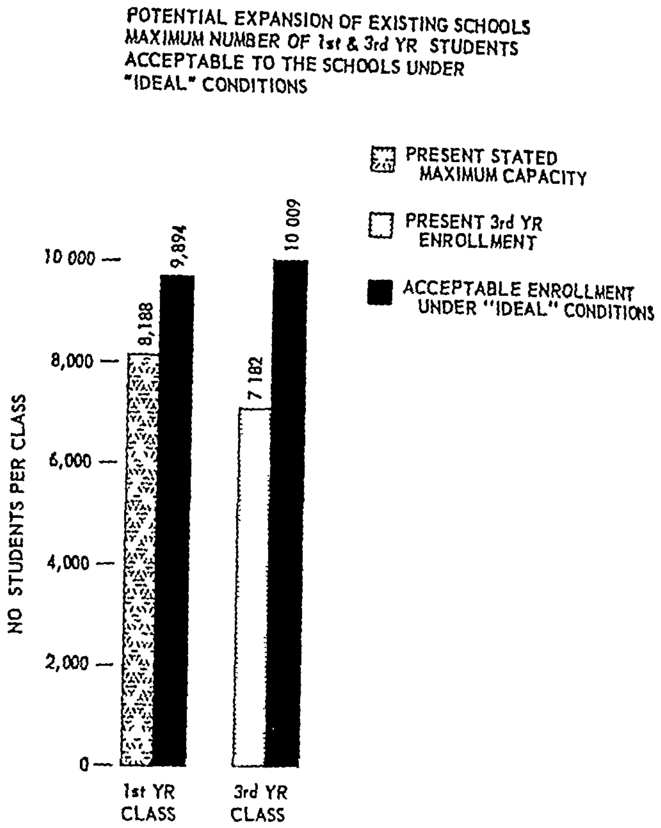

Figure 1

Expenditures

The Association of American Medical Colleges with the support of the Kellogg Foundation has been conducting for the past year a study of medical school program cost finding Mr A J Carroll, Business Officer, State University of New York Upstate Medical Center and Dr Lee Powers, Associate Director of the Association of American Medical Colleges, are responsible for the conduct of the study This section of the Annual Report on Medical Education has been prepared by Mr Carroll and Dr Powers from the financial data submitted by the medical schools in response to the joint questionnaire

The financial data presented in tables 5 (p 1433) and 6 (p 1434) summarize the detailed reports submitted by each of the 85 American medical schools that were active during 1958-59 Table 5 summarizes the following (1) expenditures for "sponsored programs," (2) expenditures for regular medical school operations, (3) income directly related to 1958-1959 operations, and (4) sources and amounts provided to cover the difference between expenditures and income directly related to 1958 1959 operations Table 5 also compares expenditures and sources of support for 1956-1957 and 1958-1959 For 1958-1959 it also shows the range of variances in the different schools for each category of expense and income

The 1956-1957 and 1958-1959 comparisons reflect some important changes in the pattern of financial support during this two-year interval For example, total expenditures increase by 33% In contrast, federal support for research increased by 62%, nonfederal support for research increase by 36%, sponsored programs increased by 55%, and expenditures for regular medical college operations increased by only 20%

Any medical school can compare the figures in its 1958 1959 report with the minimum and maximum amounts shown for each item in Table 5 Doing this will help a dean to recognize the financial problems of his college and to plan its financial future For example, federal teaching and training grants for the four-year colleges ranged from $30,466 to $1,287,728 For most schools these grants help to strengthen and improve the regular teaching programs If a dean sees that for his school the total of grants from this source is comparatively low he could take steps to obtain more teaching and training grants If his schools total should be very high, an investigation might show that the financial benefits from such grants are more than offset by the additional responsibilities that the school has assumed for graduate training Comparing its financial data with those reported from this survey will help a medical school to recognize the programs which should be brought into line to produce balanced and economical operations

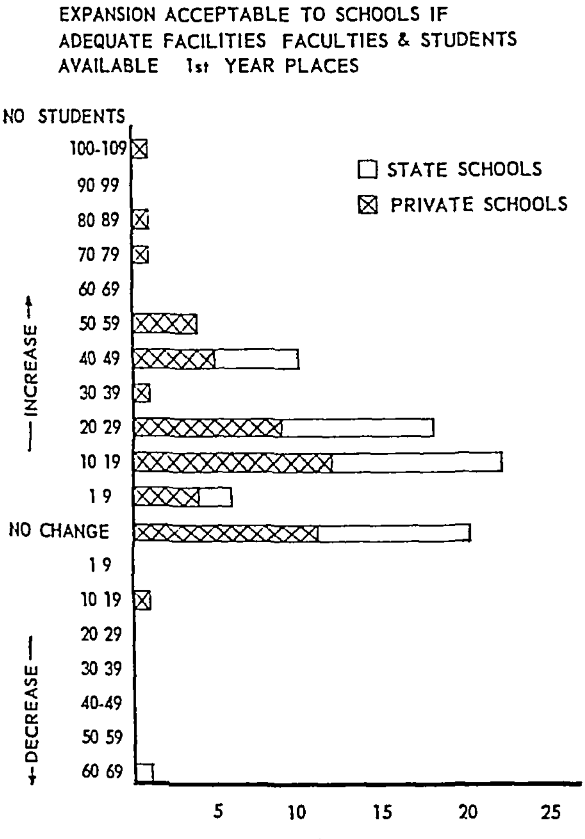

Figure 2

Table 6 (p 1434) presents various combinations of the totals in Table 5 plus some 1958-1959 details that could not be furnished by all of the schools

Sponsored Programs

Of the $319,000,000 spent by all of the medical schools in 1958-1959, $175,000 000 was for the support of the basic operating programs of the colleges, while $144,000,000, or 44% of the total, could be used only for 'sponsored programs These are the programs that are fostered and supported by outside agencies or organizations under special contracts, restricted gifts, and restricted grants Most of the money received for support of 'sponsored programs is accepted with a definite understanding that the college, to carry out the programs of the grantors and donors, will expand its activities and increase its costs, sometimes by amounts exceeding those of the grants or gifts Often grants or gifts are tailored to the interests of the sponsoring agency rather than needs of the college

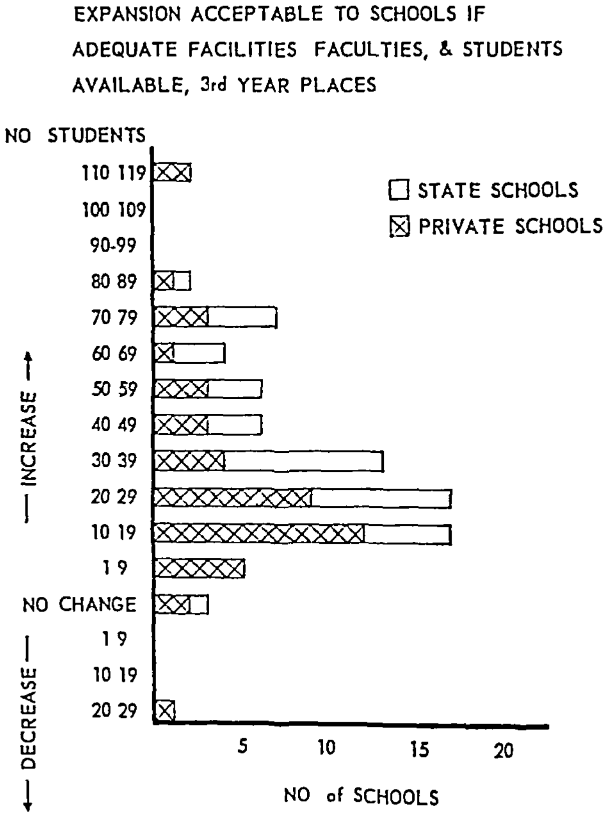

Figure 3

By studying sponsored program data one can see the multiple sponsoring interests that are represented in medical school operations, the extent by which medical school operations and programs are prescribed and controlled by these sponsors

Each year the proportion of medical school programs that is sponsored" and at least partially controlled by outside agencies is increasing—from 39% in 1956-1957 to 44% in 1958-1959 It has been predicted reliably that this trend will continue for at least 10 or 15 years Because of this trend it is important that the place of sponsored programs in medical education and their effect on medical college costs be well understood

TABLE 4 —Construction of Facilities

Estimates of Costs for Those Completed, Initiated and Planned During 1959-1960

UNITED STATES	No of Schools	Estimated* Construction Cost	Estimated* Equipment Cost	Total
Construction Completed	34	$82,331,666	$12,442,710	$94,774,376
Research	(15)	(26 609,590)	(4 478,210)	(31,087,800)
Teaching & Research	(6)	(8 946,340)	(679,050)	(9 625,390)
Hospital Facilities	(5)	(29,176,567)	(4 841,160)	(34,017,727)
Not Categorized	(8)	(17 599,169)	(2,444,290)	(20,043,459)
Construction Initiated	30	$63,833 415	$10,311,327	$74,144 742
Research	(11)	(17 669,964)	(3 846,000)	(21,515 964)
Teaching & Research	(5)	(7 727,317)	(2,666,020)	(10 393,337)
Hospital Facilities	(8)	(30,227,378)	(2,716,343)	(32 943,721)
Not Categorized	(6)	(8,208 756)	(1,082,964)	(9,291,720)
Construction Planned for 1960 1961 for which Funds are Committed	42	$115,278,460	$11,446,707	$126,725,167
Research	(17)	(49,697 638)	(4,480 081)	(54,177 719)
Teaching & Research	(12)	(29,821 822)	(2,284,626)	(32 106 448)
Hospital Facilities	(6)	(26 186,000)	(907,000)	(27,093,000)
Not Categorized	(7)	(9,573,000)	(3 775,000)	(13,348,000)
CANADA				
Construction Completed	1	10 000		10,000
Construction Initiated	1	2,750 000		2,750 000
Construction Planned for 1960-1961	3	3,800 000	350 000	4,150,000

* In certain instances equipment costs were reported as part of construction costs

Most sponsored programs are for medical research and for the teaching and training of undergraduates and graduates in medical research methodology The teaching and training grants strengthen and improve teaching programs and within reasonable limits may be regarded as contributions to the basic medical college operations This is not so true regarding sponsored research programs

Sponsored research that supports the research efforts of faculty members may enhance medical education and provide financial benefits to a medical school, but only to the extent that they do not encroach on teaching time or preempt teaching facilities A large amount of sponsored research does not necessarily mean that a medical school is being well financed

Practical and inexpensive procedures have now been made available through the Program Cost Study to all medical schools and it is expected that they will be used by many of them during the current fiscal year Besides enabling each school to identify the costs of each of its teaching, research and service programs these procedures provide the only method for accurately measuring the net financial impact of "sponsored programs" on medical college costs

Cost Comparisons

In education as well as in business, cost comparisons are essential and inevitable If medical schools do not make them, someone will do it for them and when this happens the comparisons are often misleading and dangerous For the last two years the Association of American Medical Colleges has been developing and testing methods that will enable each medical school to analyze its own financial affairs routinely and periodically, and to report them in a manner that will facilitate appropriate cost comparisons

Item 28 of Table 5 reports the costs of "Regular Medical College Operations" For the four-year medical schools these costs ranged from approximately $648,000 to $5,956,000 Simply to compare the costs of these two schools, or of any two schools, would be inappropriate and misleading But if we compare the facts that underlie the cost figures, we can tell *why the costs are so different*

Large scale comparisons of the costs of many medical schools will be of limited value Cost comparisons should be made with extreme caution or avoided entirely The most useful comparisons will be those made by the administrators of a small number of medical schools, perhaps only two

The deans and financial officers of two or more medical schools which have completed a program cost finding study by using the uniform procedures can use the summary worksheets of the program study, copies of the questionnaire prepared for this survey, and the Association of American Medical Colleges faculty salary survey report, to compare total costs, the costs of each program and activity, the gain or loss on each program, the cost of each department or division, the impact of sponsored programs on costs and the income received from each source They could see the similarities and differences in each item Other parts of the program cost study will enable them to compare the scope of each of their programs, enrollments, their unique strength and weaknesses, their organization patterns, the staffing patterns of each department, and all of the other things that, individually, or in combination, influence costs In other words, they could tell the operating areas in which their costs differed and why they differed Check lists and assistance for making such comparisons which would contribute immeasurably to more efficient management and sound financial planning for medical education will be provided

Medical School Faculties

Full-Time Faculty Positions

For the second successive year, the information collected in the questionnaire makes it possible to estimate the total number of full-time faculty members in the medical schools in the United States and Canada While these figures cannot be accepted as strictly comparable from one school to another, there probably has been no significant change in the method of reporting by the medical schools and thus are comparable for the two successive years The United States schools report 10,468 full-time

TABLE 5 —Summary of Medical College Financial Reports

	Actual Expenditures				1958-59	
	1956-57		1958-59			
	No of Schools Using Source	Amount	No of Schools Using Source	Amount	Minimum Reported for 4-Year Colleges	Maximum Reported for 4-Year Colleges
A Sources of Support for Sponsored Programs						
1 Federal contracts gifts and grants for teaching and training	81	$ 11 043 755	85	$ 20 772 182	$ 30 466	$ 1 257 728
2 Non federal contracts gifts and grants for teaching and training	61	7 463,322	65	4 660 146	0	532 950
3 Total of Sponsored Teaching and Training Programs (1 + 2)		18 507 077		25 432 328	30 466	1 423 317
4 Federal contract gifts and grants for research	85	45 646,377	85	74 128 157	71 548	3 590,210
5 State city and county contracts gifts and grants for research		Included in item 9	43	(2 855 129)	0	340 454
6 Non government contracts gifts and grants for research		Included in item 9		(31 937 435)	20 000	2,224 337
7 Endowment income restricted for research		Included in item 9	34	(3 029 630)	0	337 000
8 Other funds restricted for research		Included in item 9	17	(1 755 276)	0	851 000
9 Total of Non Federal support for research (Total items 5 through 8)	83	29 040,288	*	39,577 468	20 000	2 535 921
10 Total expenditure for sponsored research (Item 4 + item 9)		74 686 665	*	113 705 625	100 000	5,513 000
11 Miscellaneous sponsored programs (exclusive of research teaching training and student aid)			*	5 099 963	0	1 615 000
12 Total expenditures for sponsored programs (Total of items 3 10 11)		993 193 742	*	144 237 916	169 001	8 442 000
B Sources of Support for Regular Operating Programs						
13 Tuition and fees	†	20 942 554	85	24 368 278	13 273	910 597
14 Overhead on contracts and grants	†	6 111 100	85	13 339 212	0	839 702
15 Endowment income	†	14 660 842	*	17,576 918	0	1 634 000
16 Unrestricted gifts and grants	58	6 508 703	*	10 960 387	6 500	997 000
17 Medical college expense paid by teaching hospitals and clinics	30	13 252 104	28	13 727 308	0	2,557 000
18 State city or county grants in aid or subsidies paid to the medical college	10	7 902 255	11	7 592 430	0	2 429 000
19 State appropriations for defrayal of medical school expenses	†	49 066 259	40	49 778 410	0	3 440 000
20 Medical college expenses paid by medical service funds	21	3,831,832	22	10 635 435	0	1 775 000
21 Income from college services (medical laboratory etc)		Included in Item 25	45	5 259 981	0	435 600
22 Medical college expenses paid by teaching or research institutes other organizations special funds and other units or colleges of the university		Included in item 25	*	2 894 471	0	161 000
23 State payments or subsidies paid through interstate compacts such as W I C H E or S R E B		Included in item 25	11	573,342	0	261 000
24 Other income from regular operation		Included in item 25	*	3 606 679	0	272 000
25 Miscellaneous income (Total of items 21 through 24)	†	13 180 034	*	(12 336 473)	0	272 000
26 Miscellaneous university income and reserve	24	2 649 912	*	2 363 383	248 860 (gain)	390 000
27 Cost of service provided to the medical college by the university without charge (administration building and grounds etc)	29	8 303 688	30	12 114,501	0	1 654 000
28 Total expenditures for regular operating programs (exclusive of sponsored programs)		146 415 313		174 790 735	648 000	5 956 000
29 Total expenditures		239 609 055		319 028 651	992 000	11 913 000

* Combined items total N not computed
† Items corrected total N not computed

faculty members for 1959-1960, an increase of 118 positions (1%) over the preceding year Although the increase in the number of regular full-time medical students enrolled is of the same magnitude, in addition there has probably been an increase in duties and responsibilities of the medical faculty in almost every other area in which they are involved The increased responsibility for training of undergraduate and graduate nonmedical students, interns, residents, and postgraduate students has been documented in other sections of this report Research and service activities which cannot be estimated from the data at hand are probably even more increased A separation of these positions into clinical and basic science groups suggests that the increased burden on the basic science faculty may be unusually accentuated This faculty (including pathology which in the prior report was considered separately) showed an actual decrease in full-time positions of 47 (1%) The clinical group showed an increase of 165 positions (3%) over the previous year

Since strictly comparable data are not available on part-time positions, it is possible, although unlikely, that the deficiency in basic science personnel is being made up by an increased number of part-time and voluntary faculty It is more likely that these numbers represent an increased load on the medical faculties for the country as a whole, uncompensated by a corresponding increase in numbers

As has been the custom for several years, statements were solicited regarding full-time positions that have been budgeted by the medical schools but unfilled for any reason These estimates are shown for the United States schools in Table 7 In all, 851 unfilled, full-time positions are listed, an increase of 196 over the previous year Forty-three percent of these unfilled full-time positions are identified as newly established, a figure that is somewhat higher than the 35% in 1958-1959 The unfilled posts comprise a significant portion of all budgeted positions since these compilations show that 8% of all established basic science posts are vacant as are 7% of clinical positions The corresponding figure for both groups for 1958-1959 was 6% It is apparent that even the limited expansion of medical faculties, as expressed by budgeted positions, at least as far are full-time faculties are concerned, is not being implemented fully

The development of increasing numbers of unfilled faculty positions should be alarming to every one concerned with medical education The trend in the individual specialties can be seen by examination of Table 8 With few exceptions, in each area there are more vacant positions for which budget has been supplied in 1959-1960 than in the previous year In an attempt to show the seriousness and magnitude of this development more clearly, Figure 4 shows the numbers of the unfilled positions in the basic science, clinical, and total portions of the faculty for each of the past six years

TABLE 6 —Miscellaneous Medical School Financial Data for 1958 to 1959

No	Expense Items by Source of Funds		Total for All Schools
1	Expenditures for teaching, training and research from all federal grants and contracts		$94 900,339
2	Expenditures for research from local governments (State City, or County)		2 855,129
3	Expenditures for research from non government gifts, contracts and grants		31,937,435
	(a) Expenditures for research sponsored by Industry	$ 5 800,286	
	(b) Expenditures for research supported by Foundations	8,277,327	
	(c) Expenditures for research contributed from Voluntary Health Agencies	12 935,649	
	(d) Expenditures for research supported by Individuals	4 924 173	
4	Expenditures for equipment purchased from college funds but not included in totals in Table (5)		4 186,842

The total of filled and unfilled positions for which budgets have been provided by the medical schools can be taken as the schools' minimum faculty necessary for discharge of their responsibilities This total of filled plus unfilled budgeted positions for all medical schools shows a modest 3% increase over the previous year, for a total of 11,319 faculty positions In the basic science area the 1959-1960 estimate increased from 4,095 to 4,134 (1%) In the clinical area the increase for the same period was from 6,910 to 7,185, an increase of 275 positions (4%)

The corresponding figures for the Canadian medical schools are shown in Table 9 These schools reported a total faculty of 581 which is a decrease of 5 positions (1%) from the 1958-1959 year That the over-all figures do not give an adequate picture is shown when the faculty positions are separated into basic science and clinical groups The basic science group showed an actual loss of full-time faculty of 26 (7%) The clinical faculty showed a gain of 21 positions (9%) If these figures are valid, they have serious implications for the teaching of basic sciences since all evidence indicates that the number of basic science faculty is diminishing at a time when present and future demands are increasing remarkably The increase in full-time clinical faculty probably is a measure of the desirable emphasis on full-time clinical teachers

As in the United States schools, the sum of the filled and unfilled budgeted positions may be considered as the schools' estimates of the minimum full-time faculty that is necessary For the 12 schools, this figure increased from 609 in 1958-1959 to 636 in 1959-1960, an increase of 27 (4%) The figure for the basic science group showed a drop from 377 to 367 in 1959-1960 The clinical group showed an increase from 232 to 269 (16%) It is not apparent why the numbers in the basic science areas should show a decrease

TABLE 7 —Budgeted Filled and Unfilled Full Time Faculty Positions in Medical Schools in United States, 1959 1960

	Full Time Faculty Persons Now in Each Department					Old and New Positions Total				
Basic Science Departments	Instructor	Assistant Professor	Associate Professor	Professor	Total	Instructor	Assistant Professor	Associate Professor	Professor	Total
Anatomy	111	221	161	198	691	19	22	5	12	58
Biochemistry	103	205	182	183	673	13	10	9	5	37
Biophysics	38	24	18	23	103	4		1	2	7
Genetics	4	6	1	3	14	1		1	2	4
Microbiology	103	155	137	137	532	16	26	14	8	64
Pathology	165	241	148	183	737	24	27	21	12	84
Pharmacology	81	139	99	107	426	13	14	3	4	34
Physiology	101	190	141	173	605	7	20	14	6	47
Other basic science depts	3	5	6	4	18					
Sub totals	709	1,186	893	1 011	3,799	97	119	68	50	335
Clinical Departments										
Anesthesiology	129	81	41	57	308	12	9	3	4	28
Dermatology	19	19	14	26	78	2	1	3	1	7
Medical Specialties	5		1	6	12	3	1			4
Medicine	455	536	404	311	1 706	18	32	18	8	76
Neurology	54	66	30	41	191	7	2	5	2	16
Obstetrics—Gynecology	97	101	57	80	335	11	23	7	9	50
Ophthalmology	32	33	25	25	115	1	1	1	2	5
Orthopedics	31	20	22	21	94	8	2	1	2	13
Otolaryngology	33	36	21	26	116	2	3	2	4	11
Pediatrics	211	259	148	136	754	12	21	11	10	54
Physical Medicine	54	37	22	28	141	9	5	2	3	19
Psychiatry	325	297	178	148	948	29	27	20	8	84
Public Health—Preventive Medicine	90	119	74	121	404	7	13	15	12	47
Radiology	168	150	92	100	510	7	14	8	4	33
Surgery	232	221	179	183	815	27	12	11	8	58
Surgical Specialties	10	22	13	22	67		1			1
Urology	23	14	16	22	75	5	2		3	10
Sub totals	1,968	2,011	1,337	1,353	6 669	160	169	107	80	516
Totals	2 677	3 197	2 230	2 364	10 468	257	288	175	130	851

Teaching Responsibilities of Medical School Faculties For Other Than Medical Students

Table 10 portrays by schools and category of student the teaching responsibilities of faculties of medicine for students other than undergraduate medical students in 1959-1960 The total of 86,977 is some indication of the teaching responsibilities in

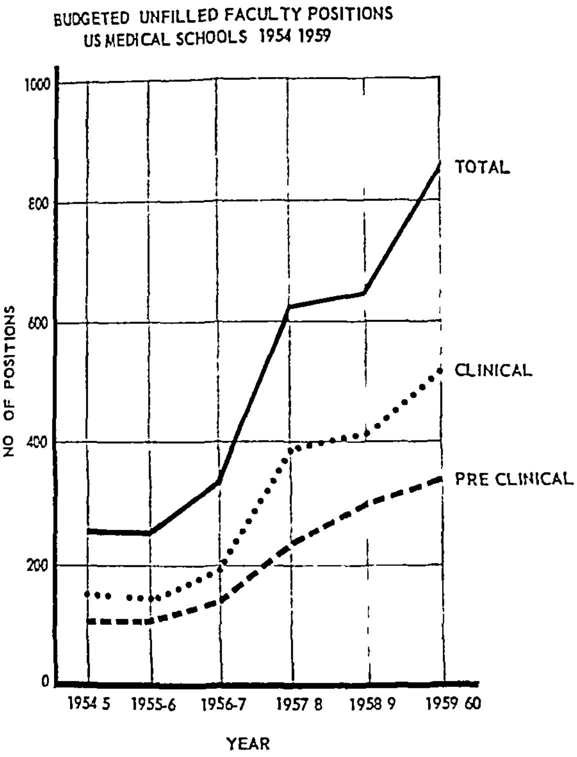

Figure 4

an area which is sometimes overlooked or underestimated when duties of the medical faculty are considered Gross numbers do not give an accurate estimate of demands on time of faculty members, but they are the best currently available

TABLE 8 —Budgeted Unfilled Full Time Faculty Positions in Medical Schools in the United States (1955 1956 to 1959 1960)

	1955-1956	1956-1957	1957 1958	1958-1959	1959 1960
Anatomy	18	22	45	55	58
Biochemistry	8	17	28	20	37
Biophysics				9	7
Genetics				1	4
Microbiology	15	18	41	40	64
Pathology	33	46	58	60	84
Pharmacology	19	17	32	35	34
Physiology	15	21	35	29	47
Sub-totals	108	141	239	249	335
Anesthesiology	10	6	24	30	28
Dermatology				3	7
Medical specialties					4
Medicine	28	29	55	48	76
Neurology				12	16
Obstetrics gynecology	16	13	28	47	50
Ophthalmology				11	5
Orthopedics				4	13
Otolaryngology				7	11
Pediatrics	12	21	35	43	54
Physical medicine				6	19
Psychiatry	21	29	55	61	84
Public health-preventive medicine	14	19	44	34	47
Radiology	8		30	36	33
Surgery	22	42	44	48	58
Surgical specialties					1
Urology				12	10
Sub totals	143	190	380	406	516
Totals	251	331	619	655	851

The amount of time and attention required of the medical school faculty for these students covers a wide range While the determination is important, no means of estimating accurately these demands has yet been devised At one extreme, interns and residents require as much or more time from faculty than do medical students In some, the medical school faculty may carry the major teaching load for the basic science training of the dental students The responsibility for student nurses, technical students and pharmacy students is apt to be less but is significant in some schools

There is undoubtedly some duplication in the numbers presented in Table 10 In the postgraduate courses, the numbers represent enrollments, and not different persons In the arts and sciences courses, and in some instances in the technical courses a student may be enrolled in more than one course taught by a member of the medical faculty Likewise a student nurse may be counted once as an arts and sciences student, and again as a nursing student

TABLE 9 —Budgeted Filled and Unfilled Full Time Faculty Postions in Medical Schools in Canada 1959 1960

	Full Time Faculty Persons Now in Each Department					Old and New Positions Total				
Basic Science Departments	Instructor	Assistant Professor	Associate Professor	Professor	Total	Instructor	Assistant Professor	Associate Professor	Professor	Total
Anatomy	13	23	14	22	72	1	5			6
Biochemistry	3	23	18	16	60		3	1		4
Biophysics	1	3	3	2	9					
Microbiology	6	18	8	9	41	1	5	1		7
Pathology	10	13	14	13	50	1	2	2		5
Pharmacology	5	13	9	8	35		2			2
Physiology	5	26	14	19	64		3	2		5
Other basic science depts		3	1	2	6		1			1
Subtotals	43	122	81	91	337	3	21	6		30
Clinical Departments										
Anesthesiology	3		2	2	7	5	1			6
Medical Specialties			1		1					
Medicine	17	20	17	12	66	2	1			3
Neurology	2	2	1	4	9				1	1
Obstetrics—gynecology	1	6	2	6	15		1			1
Ophthalmology			3	2	5		1			1
Pediatrics	6	5	6	5	22		2			2
Physical Medicine	11	1		1	13					
Psychiatry	15	18	9	10	52		3	1		4
Public Health—Preventive Medicine		6	4	7	17				1	1
Radiology	1		2	2	5					
Surgery	8	6	9	9	32	1	1	3		5
Urology								1		1
Subtotals	64	64	56	60	244	8	10	5	2	25
Totals	107	186	137	151	581	11	31	11	2	55

Because of the duplication and the lack of comparability of the different categories, these data leave much to be desired It is highly desirable that more accurate figures be obtained in order to present a realistic account of the division of effort of the medical faculties

The total number of students represents nearly

TABLE 10—Teaching Responsibilities of Medical

	Medical Schools in the United States	Undergraduates or Basic Professional Enrollment						Professional Enrollment		
		Dental Students	Pharmacy Students	Nurses	Technical Students	Arts and Science Majors	Other	Interns	Residents	Postgraduate Continuation Students[1]
1	Medical College of Alabama	95		177	63		44	33	98	23
2	University of Arkansas School of Medicine				17		19	31	91	
3	College of Medical Evangelists	218		50	90		13	181	301	9
4	University of California School of Medicine, Los Angeles			189	27	33	59	26	184	3 959
5	University of Southern California School of Medicine, Los Angeles		90	165	160	15	30	161	230	2,396
6	Stanford University School of Medicine			79			85	34	143	
7	University of California School of Medicine San Francisco	261	261	210	52			43	277	46
8	University of Colorado School of Medicine			200	21	31	3	60	210	2 128
9	Yale University School of Medicine			19	3			53	121	236
10	Georgetown University School of Medicine	163		118			33	16	149	
11	George Washington University School of Medicine		32			238		45	145	15
12	Howard University College of Medicine	267	41	40	32	20	16	15	42	2
13	University of Miami School of Medicine			310	49			75	207	15
14	University of Florida College of Medicine							12	56	
15	Emory University School of Medicine	161		25	20		40	68	180	21
16	Medical College of Georgia			66			8	1	112	155
17	Chicago Medical School							10	36	
18	Northwestern University Medical School			150	34			31	217	391
19	Stritch School of Medicine of Loyola University	12						9	27	
20	University of Chicago, The School of Medicine						107	49	139	60
21	University of Illinois College of Medicine	242	182	23	14		70	36	135	16
22	Indiana University School of Medicine	175		304	65	15	53	18	170	826
23	State University of Iowa College of Medicine	112	112	268	89	529	98	20	160	858
24	University of Kansas School of Medicine			129	29	55	20	20	125	6 [illegible]
25	University of Kentucky									
	University of Louisville School of Medicine	220		169	22		43	28	155	4
26	Louisiana State University School of Medicine			22	36		18	50	138	3[illegible]
27	Tulane University School of Medicine			77		12	2	80	174	416
28	Johns Hopkins University School of Medicine			250				62	175	158
29	University of Maryland School of Medicine and College of Physicians and Surgeons		43	49				98	151	355
30	Boston University School of Medicine			105	29	134	32	51	197	20
31	Harvard Medical School	25						92	460	414
32	Tufts University School of Medicine	200						61	113	40
33	University of Michigan Medical School	348	40	668	149	301	123	11	321	2 118
34	Wayne State University College of Medicine				15			61	150	302
35	University of Minnesota Medical School	195	31	351	217	444		39	250	1 518
36	University of Mississippi School of Medicine			54			26	23	72	375
37	University of Missouri School of Medicine			298	5	178	1 790	2	30	1
38	Saint Louis University School of Medicine	119		298	149			7	65	8
39	Washington University School of Medicine				48			55	238	158
40	Creighton University School of Medicine	90		147				8	31	
41	University of Nebraska College of Medicine			61	19			3	38	24
42	Dartmouth Medical School			126	22	4	3	16	70	
43	Seton Hall College of Medicine and Dentistry	71						33	100	
44	Albany Medical College of Union University			259	15		13	41	113	130
45	University of Buffalo School of Medicine	120	140	190	40	6		60	145	460
46	Albert Einstein College of Medicine of Yeshiva University			161	68		63	31	197	
47	Columbia University College of Physicians and Surgeons	157		361	65		116	27	351	1 900
48	Cornell University Medical College			190	20			71	223	
49	New York Medical College Flower and Fifth Avenue Hospitals			164				112	145	62

[1] Approximate annual enrollment at regularly presented short courses seminars and lectures Undoubtedly a considerable amount of duplication of individual appears

three times the total enrollment of undergraduate medical students, and represents about a 2% increase over the estimates of last year

Of 86,977 students, 45% are physicians in postgraduate courses, 18% are interns and residents, and 37% are in other categories

Thirty-three schools reported responsibility for teaching of dental students, 19 for pharmacy students, and 66 for student nurses Technical students were a responsibility of the faculties of 57 schools, arts and sciences students of 25, and some other type of undergraduate or basic professional training of an additional 45 All of the four-year schools except one reported responsibility for the training of interns and all reported teaching responsibility for residents

School Faculties for Other Than Medical Students

		Undergraduates or Basic Professional Enrollment						Professional Enrollment		
		Dental Students	Pharmacy Students	Nurses	Technical Students	Arts and Science Majors	Other	Interns	Residents	Postgraduate Continuation Students
	Medical Schools in the United States									
50	New York University College of Medicine	150		150				65	100	1 581
51	State University of New York Downstate Medical Center New York City							330	623	4 000
52	University of Rochester School of Medicine and Dentistry			215	17	130	115	58	137	41
	State University of New York Upstate Medical Center Syracuse			19				34	138	[illegible]
54	University of North Carolina School of Medicine	213	[illegible]	209	22	61	108	30	139	[illegible]
55	Duke University School of Medicine			507			17	66	191	
56	Bowman Gray School of Medicine of Wake Forest College			172	37		139	20	91	131
57	University of North Dakota School of Medicine			84	30	114				
58	University of Cincinnati College of Medicine			189				52	[illegible]	50
59	Western Reserve University School of Medicine	182		211	15			69	293	115
60	Ohio State University College of Medicine	111	4	340	17	661	502	58	210	83
61	University of Oklahoma School of Medicine			222	75			27	138	1 738
62	University of Oregon Medical School			300	55		14	30	100	401
63	Hahnemann Medical College and Hospital of Philadelphia			55				10	62	
64	Jefferson Medical College of Philadelphia							26	108	27
65	Temple University School of Medicine			287	33				120	11
66	University of Pennsylvania School of Medicine	[illegible]			41	35	48	50	278	260
67	Woman's Medical College of Pennsylvania			80	8			12	62	8
68	University of Pittsburgh School of Medicine	[illegible]		139				11	160	
69	University of Puerto Rico School of Medicine	[illegible]			21			24	70	
70	Medical College of South Carolina		113	169	5		12	25	67	
71	State University of South Dakota School of Medicine			20		100				
	University of Tennessee College of Medicine	157	163	[illegible]	65			48	[illegible]	
73	Meharry Medical College	[illegible]		[illegible]	6		8	13	20	
74	Vanderbilt University School of Medicine						59	32	91	
75	University of Texas Southwestern Medical School			280			23	[illegible]	[illegible]	1 039
76	University of Texas Medical Branch			111	48			28	147	[illegible]
77	Baylor University College of Medicine				49		[illegible]	50	231	
78	University of Utah School of Medicine		28	[illegible]	28	165	34	30	76	[illegible]
79	University of Vermont College of Medicine			53	16	10	26	15	34	[illegible]
80	University of Virginia School of Medicine			250	7			71	103	[illegible]
81	Medical College of Virginia	[illegible]	[illegible]	257	76		16	24	123	
82	University of Washington School of Medicine	4	127	822	[illegible]	403	631	81	130	[illegible]
	West Virginia University School of Medicine	26	19		9		[illegible]			
84	University of Wisconsin Medical School		118	[illegible]	27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Marquette University School of Medicine	83			231			[illegible]	[illegible]	[illegible]
	Total	[illegible]	2 016	11,887	3 181	4 039	[illegible]	3 073	[illegible]	38 999
	Medical Schools in Canada									
1	University of Alberta Faculty of Medicine	[illegible]	100	[illegible]	17	200	100	[illegible]	[illegible]	100
2	University of British Columbia School of Medicine		62	217	34	65	10	38	17	8
3	University of Manitoba Faculty of Medicine	40						[illegible]	[illegible]	
4	Dalhousie University Faculty of Medicine	30	20	30		22		50	46	[illegible]
	Queen's University Faculty of Medicine			14		8	63	34	13	4
6	University of Ottawa Faculty of Medicine		–	[illegible]				30	17	6
	University of Western Ontario Faculty of Medicine			[illegible]						
8	University of Toronto Faculty of Medicine	[illegible]	146	[illegible]	84	99	328		144	[illegible]
9	McGill University Faculty of Medicine	[illegible]		10		[illegible]	97	[illegible]	311	310
10	University of Montreal Faculty of Medicine	[illegible]	167		[illegible]		177	101		41
11	Laval University Faculty of Medicine				78		82	141	76	28
12	University of Saskatchewan College of Medicine		100	87	[illegible]	22	83	[illegible]	27	42
	Total	[illegible]	[illegible]	619	[illegible]	[illegible]	940	[illegible]	[illegible]	[illegible]

Sixty-one schools reported 38,999 enrollments of postgraduate continuation students There was wide variation in the activities of various schools in this area No enrollments were reported by 24 schools Of these 61 schools that reported postgraduate enrollment, the average was 637 students, and the median value 155

Table 10 also portrays the teaching responsibilities of medical faculties of Canadian schools for other than medical students The same reservations regarding the data and their interpretation should be kept in mind as for the United States The 12 schools reported a total of 12,672 students, an increase of 29% over the previous year This change is due mainly to a large increase in the number of postgraduate students reported (96%) In the

Canadian schools interns and residents comprise 11% of the total as compared with 18% in the American schools The postgraduate continuation students comprise 60% in the Canadian schools, as opposed to 45% in the United States

Ten of the Canadian schools reported postgraduate continuation courses with 7,556 enrollments A single school reported 6,866 of these The median enrollment of the Canadian postgraduate courses was 42

All schools, United States and Canada, reported that they had some responsibility for instruction of students other than medical students Three schools, all in the United States, reported that they had no responsibility for students other than medical students, interns, residents, and postgraduate physicians Each school in Canada reported teaching responsibilities in addition to the training of undergraduate medical students, interns, residents, and postgraduate physicians

Residents and fellows were to be excluded regardless of title Table 11 presents the information for the United States medical schools and Table 12 provides the same information for the Canadian schools

A total of 1,510 (14 4%) of the 10,468 full-time faculty members of the United States schools receive 50% or more of their salaried income from federal grants This is to be compared with a corresponding figure of 13 4% for 1958-1959 Although there were marked differences in the amount of support obtained by different disciplines as represented by departmental categories, there was little difference between basic science and clinical departments, the figures being 14% for preclinical and 15% for the clinical departments An additional 1,161 or 11% of the full-time faculty members receive some but less than 50% of their salaried income from federal sources Thus, of all faculty members about 1 in 7 full-time faculty members received at least half and more than 1 in 4 received some portion of their salaried income from federal sources These findings are shown graphically in Figure 5 (p 1442)

As might be expected, faculty support from these sources is greater in the lower academic ranks For United States faculties as a whole, 4% of professors, 10% of associate professors, 20% of assistant professors, and 21% of instructors receive at least half their salary from these sources

TABLE 11 —Full Time Faculty of Medical Schools in the United States, by Department and Rank, Who Receive 50% or More, or 1 49%, of Their Salaried Income from Federal Research and/or Training Grants

Department	Professor		Associate Professor		Assistant Professor		Instructor		Totals	
	50% or More	1-49%	50% or More	1-49%	50% or More	1 49%	50% or More	1 49%	50% or More	1 49%
Basic Science Departments										
Anatomy	4	17	12	14	14	20	10	5	40	56
Biochemistry	5	12	19	23	53	22	31	7	108	61
Biophysics	11	1	11	2	38		26		66	3
Genetics					4		2		6	
Microbiology		13	2	17	23	6	33	14	58	50
Pathology	9	16	13	30	41	21	30	17	93	84
Pharmacology	6	12	8	15	35	17	23	9	72	53
Physiology	7	17	14	21	32	20	17	14	70	72
Other basic sciences		1		1	1		2		3	2
Sub totals	42	89	79	123	221	106	174	66	516	384
Clinical Departments										
Anesthesiology	1	1			4	3	2	2	7	6
Dermatology	3	3	1		3	2	4		11	5
Medical specialties	1	1	1	1	11	4	2		15	6
Medicine	10	32	58	63	120	103	112	42	300	240
Neurology	7	4	4	9	27	18	14	11	52	42
Obstetrics-Gynecology	1	5	3	5	10	5	5	4	19	19
Ophthalmology		4	5	2	16	3	10	2	31	11
Orthopedics	1			1			1	1	2	2
Otolaryngology			1	8	4	6	7	7	12	21
Pediatrics		10	9	20	38	31	43	7	90	68
Physical Medicine	3	4	5	2	9	9	21	4	38	19
Psychiatry	5	23	37	46	96	52	104	39	242	160
Public health-Preventive medicine	4	16	3	9	28	12	27	6	62	43
Radiology	4	8	5	7	6	18	6	21	21	54
Surgery	8	8	8	15	28	31	35	20	79	74
Surgical specialties					4	1	3	4	7	5
Urology			1	1	1	1	4		6	2
Sub totals	48	119	141	189	405	299	400	170	991	777
Totals	90	208	220	312	626	405	574	236	1,510	1,161

Federal Grant Support of Full-Time Faculty Personnel

For the second consecutive year, a question was included to obtain information regarding the importance of federal research and training grants in financial support of medical faculties Estimates were obtained of the number of full-time faculty members who receive 50% or more of their salary income from federal research and/or training grants

Thirteen per cent of professors, 24% of associate professors, 32% of assistant professors and 30% of instructors received some salary from federal sources

There is fairly close agreement, but not exact correspondence, of these figures with a sample of 10 public and 6 private schools studied by Staff Committee on Support for Research and Training NIH 5, for 1958 1959 This group reported 9, 18 25, and 39% partial or complete support from federal sources for professors, associate professors, assistant professors and instructors, respectively

Biophysics, with 64% and genetics, with 43%, were outstanding as having the greatest proportion of faculty members receiving 50% or more of their salaries from federal teaching, or research grants

In the clinical sciences, neurology (27%), ophthalmology (27%), physical medicine (27%), and psychiatry (26%) showed the largest degree of proportional but not numerical support The departmental areas showing the largest numbers of persons supported are departments of medicine, in which 300 out of 1,706 full-time faculty members receive 50% or more of their salaried income from federal grants

Comparison of Tables 11 and 12 will show that the degree of federal participation in the support of medical faculties in Canada is quite different from that in the United States Only 33 (6%) of 581 faculty members received 50% or more of their salary from federal research and/or training grants Support of this nature occurs in a larger proportion of basic science (7%) than in clinical (4%) faculty One per cent of professors, 5% of associate professors, 8% of assistant professors, and 10% of instructors receive 50% or more of their support from these sources About 1 in 18 full-time faculty members derives 50% or more of his salary from federal funds Although the numbers are small, the 6% figure represents a considerable proportional increase over the previous year, when 3% of the full-time faculty members were supported in this manner

Potential Medical Faculties

In some sectors there has been concern expressed regarding the quality of teachers and research scientists presently found in the lower echelons of medical-school faculties It is of utmost importance that the junior faculty contain such superior talent that the future growth of faculties in terms of numbers and quality can be assured An effort was made to obtain some information pertinent to this supply by including a special item in the questionnaire This attempt was not altogether successful, and the information derived is of limited value and subject to varying interpretations

Each department head was asked to indicate the number of persons in his department below the rank of associate professor whom he considered capable of becoming associate professor, professor, and head

TABLE 12 —Full Time Faculty of Medical Schools in Canada by Department and Rank Who Receive 50% or More or 1 49% of Their Salaried Income from Federal Research and/or Training Grants

Department	Professor		Associate Professor		Assistant Professor		Instructor		Totals	
	50% or More	1 49%	50% or More	1 49%	50% or More	1 49%	50% or More	1 49%	50% or More	1-49%
Basic Science Department										
Anatomy			1	1				1	1	2
Biochemistry			1		2		1		4	
Biophysic										
Genetics					4		2		6	
Microbiology					1				1	
Pathology					1		1		2	
Pharmacology							1		1	
Physiology			-		1	1	2	1	[illegible]	2
Other basic science	1		1		2				4	
Sub total	1	—	[illegible]	1	11	1	7	-	[illegible]	4
Clinical Departments										
Anesthesiology										
Medical specialtie										
Medicine	1		2		1		1	-	[illegible]	2
Neurology										
Obstetric-Gynecology										
Ophthalmology										
Orthopedic										
Otolaryngology										
Pediatrics										
Physical Medicine						1				1
Psychiatry		1			1	3	1		2	4
Public health-Preventive medicine					1				1	
Radiology										
Surgery		1		1		2	1	2	1	6
Surgical specialtie										
Urology										
Sub total	1	2	2	1	3	6	3	4	9	13
Total	-	2	7	2	14	7	10	6	[illegible]	[illegible]

TABLE 13 —Graduate Degree Programs

Positions Available

	Masters										Doctorates										Postdoctorates									
	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
United States																														
Medical College of Alabama																														
University of Arkansas																														
College of Medical Evangelists																														
University of California, Los Angeles											1	4			2	[illegible]	1	4		23										
University of Southern California	1		2		2		1	7		19	24	18	5		7		3	21		78	20	2	3		1			7		33
Stanford University	6	9					3			18	4	16					6			26	2	4					3	1		10
University of California, San Francisco									10	10		7	8	3			1	10		29		10	6	3			2	3		24
University of Colorado	4						20	3		27	5					3	21	8		40	2					27	4	3		[illegible]
Yale University						2	3			5	6	4	10		10		6	7		43	1	3	5				3	1		13
Georgetown University					2					2	8	25			20			15		68	10	10			5			4		29
George Washington University	4	4			4	1	3	3		22		1			3	2	9	2		20										
Howard University	2									2																				
University of Miami		5					7	5		17								3		3						2				2
University of Florida	5	6			8		4			23	5	10			7		4	2		28										
Emory University		1						5		6	6	8			3			2		19	2	3			2		2	[illegible]		11
Northwestern University	15	12			12		12	12		63	15	12			12		12	12		63	1	2			2		4	4		16
Stritch School of Medicine, Loyola University	7				6		5	4		22	4	26			4		3	2		29	1	1					1	1		4
University of Chicago School of Medicine											4	6	4		6	2	2	8		32										
University of Illinois	10	17			14	2	15	16		71	5	13			4	1	5	6		34	2	2					2			6
Indiana University	6	10			2			5		23	4	5						3		12	2	6			1			2		11
State University of Iowa		12			12	1	10	24		59		12			8	1	5	24		50		6			2	1	[illegible]	3		11
University of Kansas	15	4			8			6		33	10	7			7		10	4		38	2	2			2		1	2		9
University of Louisville	1				9	1	4	5		20	1				2		4	3		10						8	1	4		13
Louisiana State University	3	4			4		2	3		16	3	4			4		2	3		16	2	2			2		1	3		10
Tulane University	11	5			10		4	20	3	53	6	25			1		4	20		59		15			1		2	[illegible]		23
Johns Hopkins University																														
University of Maryland											4	8			5		1	1	2	21										
Boston University	1				2		2	2		7	2	13			3		3	3		24	1	2			1		2	1		[illegible]
Harvard Medical School																														
Tufts University School of Medicine												11			1		2	6		20		4					2	1		[illegible]
University of Michigan	15	5		4				5		29	10	26		10				10		56	1	21		6				10		41
Wayne State University		6						7		13	5	12						17		34	1	4						4		9
University of Minnesota Minneapolis Campus & Mayo Foundation											21	41			40	56	18	49	22	250										
University of Mississippi	2	3			8		2	6		21	2	3			4		2	3		14										
University of Missouri	4	6			15			6		31	2	4			10			6		22	10							2		12
St Louis University																														
Washington University						1				1	5				4	2	7	2		20					4	12	6	2		24
Creighton University	6	2			8	3		4		23																				
University of Nebraska	1	3			2			2		8	2	3						2		7										
Albany Medical College											2	6			4	3	8	4		27	1	2			1		1			5
University of Buffalo	5	3	3		5		6	6		28	1	3	2		7		5	7		28	4	2	8		7		5	7		33
Albert Einstein College of Medicine											5	4			3	2	8	2		24	5	2			3	6	3	7		[illegible]
Columbia University			4						20	24	16	30			10		6	10	2	74	6						5	4		15
Cornell University	3	3			3	3	3	3	10	28	3	3			3	3	3	3	20	38	4	5			3	4	6	8	10	40
New York Medical College																														
New York University																														
State University of New York New York City																														
University of Rochester	2	25						4		31	5	18	19		16	1	6	12		80	5	3			3	3	2	2		18
State University of New York Syracuse		6			2		1	2		11	6	10			3		6	2		27		4			1		3	2		10
University of North Carolina					12	1				16					8	2				10					5					5
Duke University																														
Bowman Gray School of Medicine	1	1			2		1	2	1	8																				
University of North Dakota	6	6			1	1		5		19	6	6								12		1				2				3
University of Cincinnati								2		2								3		[illegible]								2		2
Western Reserve University	6									6	4	16			16		14	12		62	3	8			16	2	10	10		49
Ohio State University																														
University of Oklahoma											2	2			2		2	2		10										
University of Oregon																														
Hahnemann Medical College																														
Jefferson Medical College	10				2		6	6		24	6	2			6		7	6		27	4	2			2		2	2		12
Temple University	2	2			2		2	2		10	2	2			2		2	2		10	2	2			2		4	2		12
University of Pennsylvania					9		1			10	7	12			35		1	16		71	6	3					1	10		[illegible]
Woman's Medical College of Pennsylvania																														
University of Pittsburgh		4					7			11	3	5					7			15		2								2
Medical College of South Carolina	4	2					3			9	3	2					2	1		11		1								1
State University of South Dakota	2	3			6			3		14	1	1			1			1		4					1					1
University of Tennessee	8	12			2	12	4	10		48	6	6			2	6	8	17		15	2	2				12	2	4		22
Vanderbilt University		5								5	6	10			4		12	10		42	2	5			3		6	10		26
University of Texas Southwestern Medical School	3	3			5		2	3		16	3	3			5		1	3		15	1	1			1		1	1		[illegible]
University of Texas Medical Branch	4	2			4			6		16	4	1			4			4		13					1					1
Baylor University	10	10			12	2	3	4		41	4	7			7		3	2		23	2				11		1	1		15
University of Utah	4				4					8	6	20			3		2	1		32					1		1	2		4
University of Vermont	2	1			3		1	1		8		6					4			10						2	1	1		4
University of Virginia																														
Medical College of Virginia	1	2	1		1	1		1	3	10	4	1	4		1	1	4	3	2	20										
University of Washington							4			4	10	23			25		3	25		86	10	10			5		2	25		[illegible]
University of Wisconsin						14				14	9	20		10	15	18	25	20		117	3	10			1	25	5			41
Marquette University	4	6			8	20		18		56	4	2			3			5		11		4				4		2		10
Totals	199	180	38	4	211	71	144	244	34	1,125	301	466	52	23	351	111	277	497	45	2,126	126	157	22	9	90	110	102	187	16	811
Canada																														
University of Alberta																														
University of British Columbia	2	10			5	2	4	2		25	2	3			1		3			9	2	3			1		3			9
University of Manitoba		7			4		4	5		20		3			2		2	2		9										
Dalhousie University																														
Queen's University																														
University of Ottawa																														
University of Western Ontario																														
University of Toronto						2				2						1				1										
McGill University																														
University of Montreal	4	6				4				14	4	12			3	3		4		26	2					2				
Laval University	3				1	3		3	2	12	2	6				3		3	2	16	2							1		3
University of Saskatchewan																														
Totals	9	23			10	11	8	10	2	73	8	24			6	7	5	9	2	61	6	6			1	2	3	1		19

in the Basic Medical Sciences

Programs and Enrollment																															Degrees Awarded 1959-1960																			
Masters										Doctorates										Postdoctorates										Masters										Doctorates									
Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Genetics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
1	5			1	2		1		10	4	7					1	2		14															1				1		2								2
	13			1	4		1		22		2								2											1								1							1			1
	4			4	1	1	2		14		2								4											2	1				1		2		6		1								1
1		1		[illegible]		3	3		13	13	[illegible]			8		3	12		[illegible]			3							3					2		1			3	1	2			1		2			6
[illegible]	8			1	[illegible]		4		21	1	1					3	4		23		4			1		1			9		4			1			1		6		9					1	1		11
				9			4		13		7	4	3	7		1	[illegible]		31		10	3	3	[illegible]		2	2		25					1					1					1			1		2
[illegible]	5					18	8		[illegible]	4	18				2	4	7		35	–					27	3	2		31	1	1					2	1		5		5						2		7
1					3	2			6	3	4	2		7		5	2		23	1									1						1	1			2	1	1			1		1	1		5
1				3					4	3	[illegible]			[illegible]			4		44	[illegible]	5			[illegible]			4		18	1	2			2					5		[illegible]			2					5
[illegible]	4			2	4	3	[illegible]		15		4				1	[illegible]	1		17															1	1				2		1			1		2	1		[illegible]
[illegible]	9			2		1	4		18	5	18			15		14	5		[illegible]											1	4			4			1		10	1	2			3		1			7
	5					7	3		15								1		1											1									1										
4	5			8					17		3			7		[illegible]	1		14						2				2	1									1										
	1						2		3	2	[illegible]						1		[illegible]	1	2			1		2	3		9		2								2		2								2
3				1		5	2		14	8	[illegible]			2		1	1		17																											2			2
3	[illegible]			2	2	1	1		16		[illegible]			[illegible]	5	5			17													1				1				2		2			1	1	1			[illegible]
	5			4			3		19	5	3			2		[illegible]	4		22		1								1		3			3					6		1								1
[illegible]	11			9	11	1	9		43		20	8		12	8	11	11		[illegible]	1	11	1		[illegible]	2	4	7		29	3	2			3	1	1	[illegible]		13	1	3	2		3		4	1		14
9	[illegible]			11	2	12	16		67	5	[illegible]			[illegible]		[illegible]	6		[illegible]											[illegible]	6			5		[illegible]	2		21	2	5			1		2	1		11
[illegible]	10			2			2		16		2						1				[illegible]			1					4								1		1										
	7			6		6	[illegible]		31		[illegible]			[illegible]		4	22		41					1			1		5		1					2	3		6		2			3		2	6		[illegible]
1	1			6			4		12	9	[illegible]			[illegible]		3	3		27	2	1			1			1		5	1							2		3					1					1
1	8			[illegible]	1				19	1	[illegible]						1		10						8		2		10	1	2						1		4		1								1
	2			–		1	2		7	3									[illegible]	–									[illegible]								2		2										
6	5			10		4	[illegible]	5	[illegible]	1	21			4		2	[illegible]		[illegible]		12			1			1		14	2				7		2	2		13		3			1		2			[illegible]
										1	11			2					14																														
										4	[illegible]			5		1	1	2	21																					1	3						1	1	6
				1			1		2		12			2		2	2		[illegible]															1					1		1								1
										2	14	2		11	[illegible]	2	4	16	[illegible]																			1	1		2			3			1		6
												11					1	[illegible]		18		4					2	1		7													2						1		3
[illegible]	[illegible]		4	14	1	[illegible]	3		34	7	21		–	21	1	18	[illegible]		10	2	16		4	[illegible]		14	[illegible]		46		1		4	6	1	3	3		18		7			3		4	1		15
	7			3	4		5		19	2	7			2			8		19	1	[illegible]						–		6		1						1		2		3			2					5
										24	41			40	[illegible]	15	49	22	[illegible]											1	2			6		1	1	7	18	1	2			6			3		12
1				6		1	3		11	2	2			4		1	2		11											1									1					1		1	1		3
5	6			7			4		20	1	4			4			5		14	2					2				4		2			5					5										
1	1								–		[illegible]					2	5		22						1				1	1	1								2		–								–
					1				1		2				–	7	1		12		5				12	6			23						1				1								1		1
	1			2	5		1		7																							1			3			3		7										
1	3			2			–		8	2	[illegible]						2		7																			[illegible]		3										
				1		1			2		8			2	2	2	1		15																			1			1					1				–	1
	2			–			5		7	1	1			5		[illegible]	3		10			6		2		4	6		18		2								2					2					2
										5	4				1	[illegible]	2		17	[illegible]	11			1	4	3	7		31																				
		4						20	24	10	[illegible]			2		3	5		48	3						6	1		10		2							9	11		[illegible]					1	2	1	7
								5	5	1	2					1		20	24	4	2				4	6	8		24									1	1		1								1
										2	[illegible]			7	4	2			23		11			10	4		1		26											1	3				3				7
						1	1		2	[illegible]	3			1		6	[illegible]		18						5	7	2		14											1						1	1		[illegible]
1	3	3		9		1	1		[illegible]	[illegible]	1	18		4	2	7	8		[illegible]	2	2			2	–		1		9	1		18		2					21		1	3		3		1			8
	2				1	2		5	5	2					5	2		12		2					2			4								1		1							1			1
	[illegible]			6	5		2		16		9			7	1		5		22		1			5	1				5		1			1	1				3		2			2			1		5
1							1		2	7	22			6					35	5	2			2					7																				
	1							1	2																													1	1										
–	4			1			3		10	6	4								10		1								1		1								1		2								2
	2				1				3	4	3					7			14					1					1																	1			1
1									1		11			7		8	3		31	1				6	2	–	4		15	1									1		2								2
14	[illegible]				13		5			8	8				2		11		29								4		4	7	3				5		2		17		2				2		3		7
5	5			4	4	1	14		33		6			[illegible]		1	10		23											1				1			4		6		2			1			2		
[illegible]	9			3		6	5		27		[illegible]					1			6											2	3			2		3	4		14		3								3
[illegible]	8			7	3	5	2		27					1		2			[illegible]												1			4			1		6					1		2			3
				1		6	6		13		1			[illegible]		7	3		16															1		1			2					1		1	2		4
	1			–			1		4		1			1		1	1		4					1		2			3					1	1				2										
				4	2	1			7	[illegible]	12	3		[illegible]	[illegible]	1	16		69	6	3					4	3		16		3			2	1	1	1		8	1	8	2		[illegible]			3		19
						1	–		1	1									1																														
1	[illegible]					4			10	8	13			[illegible]		[illegible]			[illegible]		6								6							2			2										
						3			4	2	1					–	2		7											1					2			3		1					1			2
4	3			6			5		16		1			1			1		3					1					1		1			3			1		5										
[illegible]	[illegible]			–	9	2	10		38		4			2	1	8	17		[illegible]						2	1	4		7		4			1	1		2		8		1					1			2
1	3					1	1		6		11			2		9	4		29	1	1			4		1	3		10	1	1					1			3	1	1					1			3
				5		1	1		7	1	1			3																																	
[illegible]				[illegible]			[illegible]		[illegible]	3	1			5			4		11																					2								2		2
14	13			1			13		41	4	7			2					13					7	2				9	2	3						1		6	1	2								3
	2			11					18	6	11			10		4	1		[illegible]		13					4			20					4					4					1					1
1	1			[illegible]		1	1		7		6					4			10							1	1		2					1					1										
1	1			1			1		4																					1	1			1			1		4										
1	[illegible]								3	4	1	4				4		1	[illegible]													2								2	1									1
	1			13		2	[illegible]		21		26			9		[illegible]	[illegible]		60	[illegible]	18			1		2	[illegible]		54					4		1			[illegible]		4			1		2	2		9
1	1		1		11	1	4		22	1	16		3	10	14	20	4		[illegible]	[illegible]	10		2		20	3	1		39	1				3	2	1	[illegible]		12	1	1			1	2	3	2		10
				4	19		[illegible]		40	3					2		3		[illegible]		[illegible]				1		1		6								2												2
111	231	28	5	224	106	108	230	26	1,099	222	539	46	13	329	110	253	404	44	1,961	[illegible]	154	13	9	66	101	82	122		603	40	60	18	4	79	19	31	[illegible]	17	321	18	[illegible]	7		53	8	43	50	1	[illegible]
				4			[illegible]		12		2								2																		2		2										
1					2	2		[illegible]		1								1											1	2	1				2	4		10		1					2			3
1	2			5	2	4	1		15					1		5			6	2			2			3			5	1					1	1	1		4										
1	[illegible]			1					6		1			1		1			3																								1		1			2
1	1			1	1		[illegible]		[illegible]		2			1			1		4													1						2		3										
						2			4	1	1								2											1					1			2		1								1
		1					4		5		4	3		1			2		10													1								1		1	1		1			1		4
11	8			4		6	8		23	1	11			2	2	3	10		29															1		1	4		6		2						1		3
	1			2	2	2	2		27	4	36			7	1	4	7		[illegible]											1	4			3	2	1			11	2	13			1		2			18
1	2			2		3			6					2			4		6													2			2		1	2		7					1					1
	1				1				4		11						3		14		1								1													1								1
				1	5		2	2	11	1	2							1	4								1		1						1		1		2		1								1
[illegible]	[illegible]	1		20	11	19	[illegible]	2	131	[illegible]	[illegible]	3		1	3	[illegible]	27	1	140	–	1					3	1		7	4	10	1		6	4	7	16		[illegible]	2	20	1		4		[illegible]	2		34

of departments These figures cannot be reconciled with the figures presented elsewhere for existing faculty, since the distinction between full-time and part-time faculty members was not made Also, in the clinical field residents and postdoctoral fellows were not clearly distinguished All that can be said regarding this information is that it can be interpreted optimistically In general, the department heads seemed to feel that the majority of assistant professors, instructors, and postdoctoral fellows in their departments were capable of assuming senior faculty responsibility Collectively, they listed 3,249 assistant professors, 2,120 instructors, and 1,262 postdoctoral fellows, a total of 6,631 now in these categories, as capable of becoming senior faculty members Although the comparison must be made with many reservations, an idea of the adequacy of these numbers can be had by comparing it with the 4,594 professors and associate professors now in the United States medical schools on a full-time basis

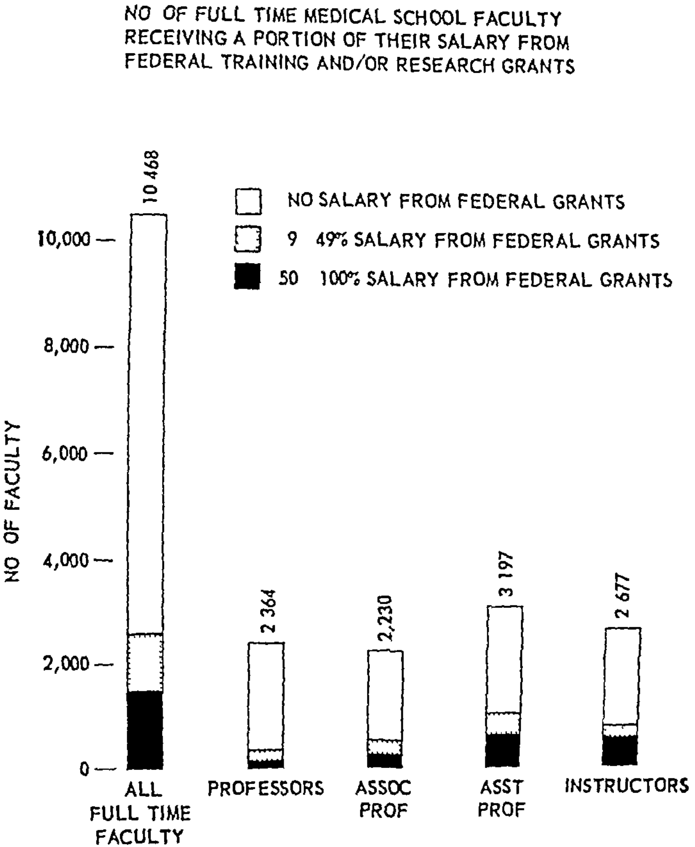

Figure 5

The estimate for the Canadian schools seems to be quite similar These schools report 314 persons in the assistant professor, instructor, and postdoctoral fellow categories as capable of becoming associate professors, professors, and department heads As above, this can be compared with a total of 288 full-time professors and associate professors in these schools in 1959-1960

Graduate Degree Programs in the Basic Medical Sciences

Table 13 shows the data secured this year regarding positions available, enrollments and degrees granted in advanced degree programs in the basic medical sciences

The total enrollment in all programs of the basic medical sciences in the United States shows an increase of 19% in 1959-1960 over the previous year Inspection of the detailed breakdown by departments and degrees shows that the change was far from uniform The total enrollment for master's degrees for the year reported was actually a 2% decrease over the previous year Even this figure is dependent on a large (45%) increase in the degree enrollment in pathology Except for pharmacology, which had a 7% increase, all other departments had decreases ranging from 2% in biochemistry to 58% in "other" categories Enrollment in doctorate programs showed similar variability, but with an over-all increase of 23% over the previous year The "other" categories showed a 25% decrease, all others showed increases The increases ranged from 5% in biochemistry to 73% in physiology and 104% in pathology

The major increase, accounting for most of the favorable showing in the total, was in the postdoctorate group The increase in this group was 69% over the previous year Biophysics (38% decrease) was the only category failing to show an increase The increases ranged from 46% in pathology to 195% in anatomy

Since actual enrollments in the degree programs and the degrees granted show marked fluctuation from year to year it is very difficult to get a clear idea of the quantitative trend in the various disciplines over recent years It is especially important to do so in view of the widespread concern over the availability of trained persons to fill vacant and proposed positions in expanding medical school faculties In an effort to show trends more clearly, the data for the past four years were rearranged by departments, enrollments for each degree, and enrollments for postdoctorate study The actual degrees granted for each year at the master's and doctorate levels were also recorded These data are presented in Table 14 Pathology was omitted from this table since its staffing problems seemed to be more closely related to the clinical than to the basic science area Genetics and "other" were omitted because of small numbers or the non-specificity of the category All three are included, however, in the totals

Inspection of Table 14 shows a gratifying growth over the 4-year period for the areas of biochemistry, pharmacology, and physiology Anatomy and microbiology show greater fluctuation and more inconsistency of growth The biophysics programs, although relatively recent in their development, show a downward trend rather than an increase in numbers of students

Attention is called to the striking increase in number of postdoctorate students in all of the fields except biophysics The exact meaning of this devel opment is not clear The 603 postdoctorate students working in basic science departments are an important source of future senior faculty members in both basic and clinical sciences This category shows an increase of 68% over the previous year and 214% over the 1956-1957 period To what extent these persons should be considered part of the present faculty cannot be determined without additional information but undoubtedly they serve important and necessary faculty functions

Similar data are presented in Table 15 for the Canadian schools The numbers are too small to warrant detailed analysis As compared with previous years the total number of master's degree enrollments showed an increase of 6% over the previous year and the number of doctorate candidates showed a 16% increase

Inspection of Table 15 shows that the undergraduate basic science programs in the Canadian schools, with the exception of the postdoctorate students, have had a modest increase in capacity over the past 3 years, in about the same proportion as has occurred in the United States schools The postdoctoral students do not appear to be an important segment of the group in training in Canadian medical schools

It is apparent from the data presented in Table 13 that there is no shortage of positions available for students who want to pursue graduate study in the medical sciences In each general category (master's, doctoral, and postdoctoral), the number of listed positions is slightly in excess of the number of students now enrolled The excess is much smaller than in 1958-1959 Detailed comparison of the 1959-1960 returns with previous figures strongly suggests that the diminished excess isdue to incomplete reporting Many schools apparently did not list positions which were unfilled

It is probable that any well-qualified students would have little difficulty in finding a position to do graduate work in the basic medical sciences in the United States The data on Canadian schools are incomplete and no conclusions can be drawn

TABLE 14 —Enrollments for Advanced Degree and Post Doctoral Studies, and Degrees Awarded in Selected Basic Science Departments of United States Medical Schools for Years 1956 1957 to 1959 1960 Inclusive

Department		1956 1957	1957 1958	1958-1959	1959 1960
Anatomy					
Enrollment	M A	107	105	151	141
	Ph D	1[illegible]	1[illegible]9	180	223
	Post doctorate	35	11	19	56
Degree granted	M A		36	41	40
	Ph D		30	29	18
Biochemistry					
Enrollment	M A	2[illegible]	239	235	231
	Ph D	41[illegible]	457	512	539
	Post-doctorate	6[illegible]	52	97	154
Degrees granted	M A		61	48	60
	Ph D		75	78	95
Biophysics					
Enrollment	M A	28	67	3[illegible]	28
	Ph D	52	57	38	46
	Post doctorate	0	39	18	1
Degree granted	M A		21	22	18
	Ph D		8	8	7
Microbiology					
Enrollment	M A	225	247	250	224
	Ph D	240	279	289	329
	Post doctorate	22	26	35	66
Degrees granted	M A		75	58	7[illegible]
	Ph D		77	52	53
Pharmacology					
Enrollment	M A	67	127	101	108
	Ph D	16	174	229	2[illegible]
	Post doctorate	12	28	50	82
Degree granted	M A		16	24	31
	Ph D		38	32	43
Physiology					
Enrollment	M A	163	202	240	230
	Ph D	[illegible]	260	232	404
	Post doctorate	26	40	64	122
Degrees granted	M A		58	50	63
	Ph D		45	43	50
Total					
Enrollment	M A	921	1 119	1 124	1 099
	Ph D	1 304	1 416	1 590	1 961
	Post doctorate	192	219	359	603
Degree granted	M A		282	267	321
	Ph D		282	258	275

Total includes Genetics Pathology and Other not listed above

TABLE 15 —Enrollments for Advanced Degree and Post Doctoral Studies and Degrees Awarded in Selected Basic Science Departments of Canadian Medical Schools, for Years 1957 1958 to 1959 1960 Inclusive

Department		1957 1958	1958-1959	1959 1960
Anatomy				
Enrollment	M A	4	17	16
	Ph D	7	5	7
	Post doctorate	2		2
Degrees granted	M A		2	4
	Ph D	2	2	2
Biochemistry				
Enrollment	M A	37	36	32
	Ph D	58	62	71
	Post doctorate	1	1	1
Degrees granted	M A	18	16	10
	Ph D	17	16	20
Biophysics				
Enrollment	M A			1
	Ph D	3	3	3
	Post doctorate			
Degrees granted	M A			
	Ph D	2	1	1
Microbiology				
Enrollment	M A	14	11	20
	Ph D	12	11	1
	Post doctorate	2	2	
Degrees granted	M A	5	4	6
	Ph D	5	5	4
Pharmacology				
Enrollment	M A	8	15	19
	Ph D	7	14	13
	Post doctorate		2	3
Degrees granted	M A	3	4	7
	Ph D	6	1	5
Physiology				
Enrollment	M A	22	32	30
	Ph D	16	17	27
	Post-doctorate	1		1
Degrees granted	M A	3	6	16
	Ph D	3	7	2
Total*				
Enrollment	M A	91	13[illegible]	141
	Ph D	110	121	140
	Post doctorate	6	5	7
Degrees granted	M A	38	35	47
	Ph D	36	32	34

Total includes Genetics Pathology and Other not listed above

Graduate Degree Programs in the Clinical Sciences

Table 16 presents the information reported for the year 1959-1960 by medical schools in the United States and Canada on master s and doctorate degree programs and enrollment Degrees granted in the clinical fields of work are shown in the same table These exclude work toward the M D degree but include physicians working toward another degree

Thirty-four schools in the United States actually awarded 284 master's degrees One hundred and thirty of these were in a special category, being

TABLE 16 —Graduate Degree

	Programs Available																			
	Masters										Doctorates									
	Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties	Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties
United States																				
College of Medical Evangelists																				
University of California, Los Angeles		✓							✓											
University of Colorado						✓	✓	✓									✓			
Yale University	✓	✓		✓		✓		✓	✓											
Georgetown University							✓										✓			
George Washington University			✓						✓											
University of Miami																				
Medical College of Georgia																				
Northwestern University		✓																		
University of Chicago School of Medicine																				
University of Illinois												✓							✓	
State University of Iowa		✓							✓										✓	
Tulane University						✓	✓			✓✓✓✓							✓			
Harvard Medical School	✓						✓				✓						✓			
Tufts College Medical School	✓								✓											
University of Michigan	✓✓		✓						✓	✓										
Wayne State University																				
University of Minnesota (Minneapolis Campus and Mayo Foundation)											✓✓✓✓	✓	✓	✓	✓	✓	✓	✓	✓	✓✓✓✓✓✓✓✓
University of Mississippi									✓											
St Louis University																				
Washington University										✓										
Creighton University		✓		✓	✓	✓		✓	✓											
University of Nebraska		✓		✓	✓	✓								✓						
University of Buffalo																				
Columbia University	✓✓						✓										✓			
Cornell University							✓										✓			
New York Medical College																				
State University of New York New York City																				
University of Rochester							✓													
Bowman Gray School of Medicine						✓														
University of Cincinnati							✓										✓			
Ohio State University					✓															
University of Oklahoma							✓										✓			
Temple University										✓✓✓✓✓										
University of Pennsylvania																				
University of Pittsburgh						✓														
University of Puerto Rico																				
University of Tennessee																				
University of Texas Southwestern Medical School																		✓		
University of Texas Medical Branch																	✓			
Baylor University	✓					✓		✓												
University of Utah																			✓	
University of Virginia																				
Medical College of Virginia																				
University of Washington									✓											
University of Wisconsin	✓																			
Marquette University	✓	✓		✓				✓	✓	✓										
Total	9	7	3	4	[illegible]	8	9	5	10	[illegible]	3	2	1	2	1	1	10	2	[illegible]	1
Canada																				
University of Alberta																				
University of British Columbia																				
University of Manitoba		✓				✓			✓										✓	
Queen's University																				
University of Western Ontario																				
University of Toronto																				
McGill University		✓	✓			✓			✓			✓	✓						✓	
University of Montreal																				
University of Saskatchewan																				
Total		2	1			2			2			1	1						2	

awarded in public health and preventive medicine by 4 schools in which the department actually functions as a school of public health Of the remaining 154 degrees granted, 72 were awarded by only 2 schools, the University of Minnesota and Ohio State University

Six schools granted 17 doctorate degrees Nine of these were in public health and preventive medicine Awards were also made in the areas of medical specialties, radiology, surgery, and surgical specialties

In Canada, 4 schools conferred 21 masters degrees Degrees in the areas of medicine (8) and surgery (9) accounted for most of these, but neurology and psychiatry were also represented One Canadian school conferred 2 doctorate degrees in the field of internal medicine

The significance of graduate education leading toward a degree in the clinical fields is difficult to assess It is probable that at least a portion of the training identified in Table 16 actually involves study and research that is just as fundamental as

Programs in the Clinical Sciences

Programs and Enrollments																																	Degrees Awarded 1959-1960																					
Masters											Doctorates											Postdoctorates											Masters											Doctorates										
Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties	Total	Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties	Total	Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties	Total	Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties	Total	Medical Specialties	Medicine	Neurology	Obstetrics & Gynecology	Pediatrics	Psychiatry	Public Health—Preventive Medicine	Radiology	Surgery	Surgical Specialties	Total
	[illegible]							15		12																																												
					2		1																										1	1							[illegible]		[illegible]											
[illegible]	5		4		2		1	4		18																													34				[illegible]											
						46				46								[illegible]			2																																	
																						2	[illegible]	2						3		1																						
	2									[illegible]																								2									2											
	2							2	1	5																															2		2											
																			1		4		7				9					16																						
								[illegible]		[illegible]																															5		5											
								4		4									1		1																																	
					9	1			17	27								4			4																		1			9	10							2				2
1						28				29	5							8			16	1						2			1	[illegible]							28				28	1						4				[illegible]
1								4		5																															3		3											
		1			1			9	13	24																							2		1			1			2	4	10											
1										1																							1										1											
											17	11	5	20	[illegible]	7		14	[illegible]	213	1,087												1	12	1	1	1	[illegible]	1	3	12	14	48									3	1	4
	1									1																								1									1											
									1	1																																1	1											
			[illegible]	2			1	15		31																								1		2						2	5											
	4		2		44					50					1						1				1							1																						
																						4		6								10																						
11						4				15								6			6												4						38				42							1				1
																		2			[illegible]							5				5																						
																	4				4	1	5				13			5		24																						
						3				3													2				1					3							3				3											
					1					1																																												
						8				8			1					[illegible]	3		[illegible]																		4				4							2		1		3
	[illegible]		12	3	14			45	1	82																										3	3	1			13	1	24											
						4				4								6			6																		1				1											
																																		3		1	1	2				7	14											
						1				1											3							4				1																						
					9					9																												2					2											
																																							30				30											
			1						7	8																										1							1											
																		1			1								1			1																			1			1
																		3			3																																	
[illegible]					3					[illegible]													6			10				10	1	27																						
																			1		1					1						1																						
								2		2																															2		2											
								1		1																																												
91	[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	40	435	[illegible]	31	[illegible]	30	7	40	48	[illegible]	277	[illegible]	1,170	11	[illegible]	8	1	11	23	11	1	18	2	142	15	23	2	8	[illegible]	8	140	3	44	36	284	2						9	1	4	1	17
	1							2		[illegible]																								1									1											
	6				4			[illegible]		[illegible]																								1									1											
	1		1							2																																												
	1				1					2								1			1																																	
								2		2																															2		2											
	19	5						14		[illegible]			12	2					1		15													6	2			1			7		16											
	3									3		1	7								8																								2									2
					2					2							1				1																																	
	31	5	1		7			21		65		1	19	2			1	1	1		25													8	3			1			9		21		2								—	2

that identified in the basic science section Probably, also, a portion of the students registered for advanced degrees in some schools would be listed as residents in other schools Both groups might receive the same kind of training Although not listed as degree candidates, the preponderant proportion of physicians obtaining advanced clinical training in the United States and in Canada are doing so with no reference to an academic degree

Similar data describing basic science training are thought to have an important relationship to the supply of available and potential medical school teaching personnel It is doubtful whether any such relationship holds in the clinical field

Student Recruitment Activities

There has been widespread concern because of the decreasing numbers of qualified students who apply for admission to medical school That this has occurred during recent years despite increasing numbers of college graduates has been particularly disturbing[6] Through the cooperative efforts of the

Council on Medical Education and Hospitals and the Communications Division of the American Medical Association and the Association of American Medical Colleges, a variety of medical career materials has been prepared

The medical career information has been distributed widely to high-school and college counseling and guidance officials as well as to state and county medical societies Medical schools also have received these materials, which were designed especially for presentation to high-school and early college students The program to promote the use of the career informational materials was initiated in April, 1960 The great interest and extensive usage generated have been most heartening

TABLE 17 —Schools, Students, and Graduates in the Medical and Basic Medical Science Schools in the United States, 1931 1960

	Schools	1st Year	2nd Year	3rd Year	4th Year	Total	Graduates
1930 1931	76	6,456	5,538	5,080	4,908	21,982	4,735
1931 1932	76	6,260	5,162	4 932	4,881	22,135	4,936
1932 1933	77	6,426	5,479	5,017	4,948	22 466	4,895
1933 1934	77	6,457	5,571	4,988	4 937	22 799	5 035
1934 1935	77	6 356	5 642	5,142	4,905	22,888	5 101
1935 1936	77	6,605	5,458	5,230	5,020	22,564	5,183
1936 1937	77	5 910	5 269	5 140	5,158	22,095	5 377
1937 1938	77	5 791	5,225	4,986	5,036	21,587	5,194
1938 1939	77	5,764	5,160	4 947	4 921	21 302	5,089
1939 1940	77	5 794	5,177	4,921	4,894	21,271	5,097
1940 1941	77	5,837	5,264	4,969	4 849	21,379	5,275
1941 1942	77	6,218	5,406	5,087	4,942	22 031	5,163
1942 1943	76	6 425	5 828	5,278	5,100	22 631	5 223
1943 1944	77	6 561	6 071	5 640	5 257	23 529	5 134
1944 (2nd session)	77	6 648	6,140	6,084	5,791	24,666	5 169
1944 1945	77	6,523	5,979	5 700	5,826	24,028	5,136
1945 1946	77	6,060	5,700	5 751	5 655	23 216	5 826
1946 1947	77	6,564	5,675	5,767	5,994	23 900	6 389
1947 1948	77	6,487	5 758	5,154	5,340	22,739	5 543
1948 1949	78	6 688	6 194	5 702	5 086	23 670	5 094
1949 1950	79	7 042	6 344	6 079	5 638	25 103	5 553
1950 1951	79	7 177	6 690	6 263	6 056	26 186	6 135
1951 1952	79	7,436	6,864	6,577	6,195	27,076	6 080
1952 1953	79	7 425	7 063	6,725	6,475	27,688	6,668
1953 1954	80	7,449	7 068	6,983	6,727	28 227	6 861
1954 1955	81	7,576	7,104	6,957	6 946	28,583	6,977
1955 1956	82	7 686	7,174	6,893	6 886	28 639	6 845
1956 1957	85*	8,014	7,259	7,023	6 834	29,130	6 796
1957 1958	85*	8 030	7,504	7 051	6 888	29 473	6,861
1958 1959	85†	8,128	7,432	7,182	6 872	29,614	6 860
1959 1960	85	8,173	7,563	7 214	7,134	30 084	7 081

* Includes schools in development

† Includes schools provisionally approved

This interest also appears to be reflected in the recruitment activities of medical schools and their faculties There are 30 schools with organized programs directed at the high-school level and 13 others have active programs in the process of development Thus, there are or shortly will be organized high-school student recruitment activities in half of the medical schools In 15 of the remaining schools, faculty members engage in recruitment activities on an individual basis, leaving 28 medical colleges that for the time being are not participating to any extent in this important endeavor

Forty-six medical schools have organized programs for dissemination of career information to college students, and an additional 11 have such programs planned for the near future In 17 of the 29 medical schools with no organized program at the college level now active or planned, the faculty members undertake this activity on an individual basis

Highlights of some of the newer medical-school recruitment programs are briefly described More complete information regarding these can be obtained by writing to the institutions concerned

Intelligent and interested high-school students are offered opportunity to participate in medical research as junior research fellows at Georgetown Kansas, and Oklahoma The University of Washington has initiated an experimental summer training program to provide research experience to premedical and medical students who may be potential educators and researchers Closely related to this is the opportunity for participating in the expanding city, state, and regional science fairs The University of California at San Francisco sponsored a local science fair for high-school students last year and used this opportunity to discuss medical careers and to conduct tours of the medical center for interested students The State University of New York at Syracuse has also sponsored science fairs and more recently, in cooperation with the Boy Scouts of America, formed an "Explorer Unit" This program is designed to inform qualified high-school boys of the opportunities in medicine and includes scientific demonstrations, experiments and discussions, as well as service projects and field trips

Medical Students Enrollments

In 1959-1960 the number of students enrolled in the 85 medical schools in the United States was again larger than in previous years Total enrollment of medical students was 30,084, an increase of 470 over the previous year Comparative data since 1930-1931 are given in Table 17 and Figure 6 The total first-year class enrollment was essentially the same as last year, i e, 8,173 in 1959-1960 compared with 8,128 in 1958-1959 The second-year enrollment reflected an increase of 131 over the previous year, and the third-year figures were relatively the same for the two years Enrollment in the fourth year showed an increase of 262 in 1959-1960 over 1958-1959 This latter increase reflects the marked increase in the first-year enrollment in 1956-1957 Complete enrollment data for individual schools are shown in Table 1

All of the four-year schools included in Table 1 listed enrollment in each of the four years In 1959-1960 only one new school was developing, the University of Kentucky The figures in Table 1 for enrollments include the special and part-time students The numbers of these special and part-time students are tabulated for each school in the col umn after total enrollment, although they are distributed in the enrollment figures for each class in the prior columns No special study of this group was done during the current year It is of interest to note that the largest number of such students in any one school was 20 out of a total enrollment of 330

TABLE 18 —Schools, Students and Graduates in the Medical and Basic Medical Science Schools in Canada, 1948 1960*

	Schools	1st Year	2nd Year	3rd Year	4th Year	Total	Graduates
1948-1949	10	857	765	812	799	3,233	679
1949-1950	10	837	[illegible]	761	822	3 278	791
1950-1951	11	940	[illegible]	811	805	3 189	[illegible]
1951-1952	11	873	891	[illegible]	879	[illegible]	[illegible]
1952-1953	11	918	909	[illegible]	[illegible]	[illegible] 444	[illegible]
1953-1954	12	982	901	844	916	3 643	896
1954-1955	12	968	[illegible]	[illegible]	834	[illegible]	[illegible]
1955-1956	12	1 035	885	[illegible]	[illegible]	[illegible]	816
1956-1957†	12	1 001	[illegible]	[illegible]	[illegible]	[illegible]	893
1957-1958	12	1 012	916	825	839	3 69[illegible]	[illegible]
1958-1959	12	976	911	867	904	[illegible]	850
1959-1960	12	916	882	[illegible]	858	3 [illegible]19	863

* Figures do not include premedical or intern years

† The remaining school of the basic medical sciences (Saskatchewan) became a four year school with students in all years

The median total enrollment of all 85 schools in 1959-1960 was 327, and the average total enrollment was 352 If the group of 81 four-year schools is considered, the median total enrollment was 342 and the average total enrollment was 368

Fourteen schools had a total enrollment greater than 500 Five schools had a total enrollment of 600 or more (Indiana, Jefferson, Michigan, Illinois, and Tennessee) Two of these admitted 200 or more students to the 1959-1960 entering class (Illinois 200 and Tennessee 203) Indiana, one of the five largest schools, admitted 22 more students in 1959-1960 than in the year before The other four schools showed no appreciable change in enrollment over the previous year In addition to the foregoing, there were two state schools having first-year enrollments of 150 or more (New York at Brooklyn and Ohio)

The total entering class (8,173) shows an increase of only 45 students over the figure for 1958-1959, nevertheless, it represents the largest enrollment to date in approved medical schools in the United States The fact that no new classes were beginning in newly developing schools during 1959-1960 stabilized the first-year enrollment figure Entering class size increased in 37 schools, remained unchanged in 20, and decreased in 28 Seventy-five per cent of the changes involved only 1 to 3 students Substantial increases occurred at Stanford (16%), Indiana (14%), and Western Reserve (12%) Major decreases occurred at Wisconsin (13%) and at Saint Louis University (10%)

The median entering class numbered 86, the same as last year The average size for the first-year class was 96 1, which represented an increase of less than one over the previous year

The 12 Canadian schools in 1959-1960 had a smaller total enrollment in the four medical-school years than was reported a year ago (Table 18) The drop of 119 in the total enrollment is reflected in decreased enrollment in each of the four years as compared with the figures for 1958-1959 A more detailed study of enrollment in the Canadian schools is shown in Table 2 The median enrollment for the 12 schools in 1959-1960 was 221 and the average 296 Both of these figures are lower than those reported for last year Only two schools reported an increase in enrollment over the previous year and the total of both was only 7 students The remaining 10 schools reported decreases in total enrollments, the greatest decreases occurring at Ottawa (12%), Manitoba (8%) and Laval (8%)

Enrollment in the first-year class for 1959-1960 showed a general decrease, with a drop of 18% at Montreal being the largest The number of graduates for 1959-1960 (863) was the largest since 1956-1957 The general decrease in enrollment in schools in Canada represents a different kind of development than is occurring in the United States It is not possible to interpret this situation

Geographic Source of Entering Students

The residence of students at the time of their enrollment in the medical schools is shown in Table 19 for public schools and in Table 20 for private schools in the United States "Residence' as used in this study is that which has been reported by the individual medical schools These figures are based on the 1959-1960 enrollment data furnished by the

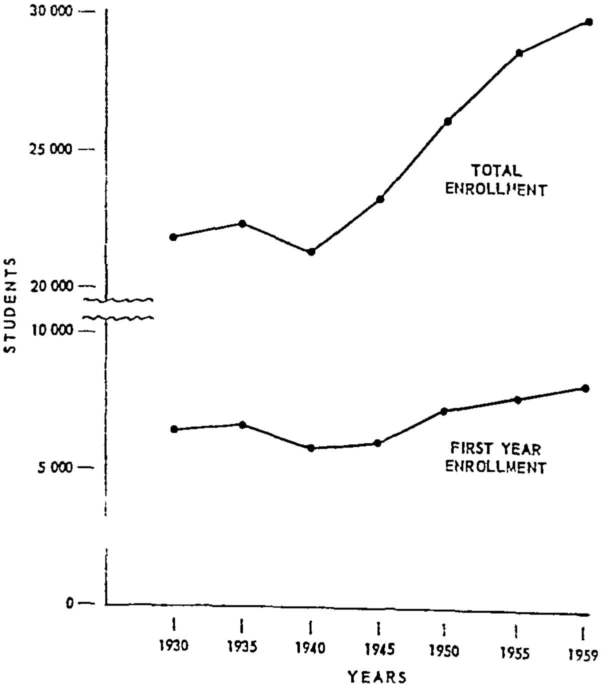

Figure 6

medical schools to the Association of American Medical Colleges

Inspection of the two tables illustrates, as in the past, that the privately owned schools have a wide geographic scatter pattern of first-year students, whereas publicly owned schools with geographic restrictions accept students largely from their own states Seven publicly owned schools accepted no out-of-state students, six schools accepted less than 5%, eleven schools between 5% and 10%, and six schools between 10% and 20% of the entering class from nonresident applicants (Table 21, p 1452) The University of Illinois provided places for 198 residents of Illinois in 1959-1960, this was the largest single first-year resident enrollment in a publicly owned medical school

Of the 45 privately owned schools, 21 accepted more residents of the state in which the school was located than nonresidents Only 5 schools, however, accepted less than 20% of the class from applicants whose residence was other than the state in which the school was located (Table 20)

As has been the case for the past four years, 41% of the entering class came from six states (New York 13%, Pennsylvania 7%, Ohio 6%, Illinois 6%, California 5%, and Texas 4%) The 32 medical schools in these six states enrolled 40% of the total entering class in 1959-1960

There were fewer than 20 first-year medical students from each of seven states (Alaska, Delaware, Maine, Nevada, New Hampshire, Vermont, and Wyoming) Five additional states had between 20 and 30 students enrolled in medical schools (Hawaii, Idaho, Montana, New Mexico, and Rhode Island) Only 2 of the 12 states listed above have medical schools One of these, the University of Vermont, enrolled 17 residents of Vermont and 35 nonresidents (67%) in its entering class, the other, Dartmouth in New Hampshire, enrolled 3 students from that state and 21 or 88% nonresidents in its entering class

Of the 229 students from the 11 states that have no medical schools, 148 were admitted to privately owned schools and 81 to publicly owned schools

In Table 22 are listed the states in ascending order according to the number of enrolled first-year medical students per 100,000 population As has been the case in previous years, the six states originating the largest number of first-year students are distributed throughout the list, although only two (California and Texas) had fewer than the median of 4 5 students per 100 000 population Of the 12 states having the fewest first-year students, all were below the median with the exception of Wyoming (4 8), Alaska (4 5), and Montana (4 5) Twenty-six states showed an increase in the student-

TABLE 19 —Geographical Source of Entering Students in Public

	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland
Medical College of Alabama	71									1											
University of Arkansas				90															2		
University of California, Los Angeles		2			53																
University of California, San Francisco			1		98																
University of Colorado		1	5			62											2				
University of Florida										46				1							
Medical College of Georgia											102										
University of Illinois														198	1						
Indiana University	1											2		2	163						
State University of Iowa			1											4		111					
University of Kansas					1	1											86				
Louisiana State University																			128		
University of Maryland		1			2			1		1											77
University of Michigan	1		1		9						1			1	1						1
Wayne State University																					
University of Minnesota														2							
University of Mississippi	1																				
University of Missouri																					
University of Nebraska			1		2											2					
State University of New York, New York City							3														1
State University of New York, Syracuse																					
University of North Carolina											2										
University of Cincinnati					2													6			
Ohio State University																					
University of Oklahoma																					
University of Oregon		1			1							2	7								
University of Puerto Rico																					
Medical College of South Carolina																					
University of Tennessee	6		1	3						2	5			2				5			
University of Texas, Southwestern					1									1							
University of Texas, Medical Branch																					
University of Utah			1		1	1							5								
University of Vermont							1													5	
University of Virginia							1		1	2								2			
Medical College of Virginia					2			1	2	2	1										2
University of Washington		2			1								5								
University of Wisconsin							1					1				1					
Schools of Basic Medical Sciences																					
University of North Dakota																					
State University of South Dakota					2		5									3					
West Virginia University																					
Totals	80	7	11	93	175	64	11	2	3	54	111	5	17	211	165	117	88	13	130	5	81

population ratio in 1959-1960 over last year, 5 remained unchanged, and in 19 states there was a decrease The greatest increases occurred in Wyoming (from 2 5 to 4 8), Vermont (from 3 0 to 5 1), Alaska (from 2 4 to 4 5), and North Dakota (from 5 7 to 7 5) The greatest decrease was in Nevada, with the student-population for 1959-1960 dropping to 1 9 from the 5 0 figure for 1958-1959

The over-all ratio of students per 100,000 population was 4 7, 0 1 more than last year and the same as in 1957-1958 The population figure used for the 1959 1960 study was as of Dec 7, 1959, and included the civilian population of Hawaii and Alaska but excluded the Armed Forces The increase of 45 students in the entering class of 1959-1960 just kept pace with the total population growth

Medical and Basic Medical Science Schools of the United States

Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Puerto Rico	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Guam Panama and Others	Canada	Foreign	Home State	Out of State	Total
	1			1					1											2		1												71	9	80
																																		90	2	92
											1					1																		53	4	57
										1														1										98	3	101
					1					9													1							4				62	23	85
														1																			1	46	3	49
																																		102		102
											1																							198	2	200
									1		2			3			3																5	163	19	182
			1						2		1																							111	9	120
				10						1					1																		1	86	15	101
																																		128		128
					1			1	4		5		1				2							1		1							2	77	23	100
	150					1			1		8			13			1						1	1					2				3	150	46	196
	126																																	126		126
		128			2						1						1				4								1				2	128	13	141
			76								2						1																	76	4	80
				75																														75		75
						78								1			1																	78	7	85
3									5		141						1																1	141	14	155
									8		74																						1	74	9	83
											2	63					1										1							63	6	69
1	1								2		2			78			1											1						78	16	94
														150																				150		150
															99		1																1	99	2	101
					2											61											2						3	61	18	79
											1						1	50																50	2	52
																				80														80		80
			8	4								6								2		150	6					3						150	53	203
				1							1				1								98							1				98	6	104
				1																			147											147	1	148
					1												1							42										42	14	56
21								3			4								1						17									17	35	52
2									2		8	1					3						1			48		2					3	48	28	76
							1		1		1	3		1			2			3						54		7	1					54	30	84
	1	1			3																						64				1			64	14	78
									1		1																		83					83	5	88
		3											41																					41	3	44
		3			2											1					27							1						27	17	44
																												45						45		45
27	279	135	85	92	12	79	1	4	28	11	256	73	42	247	101	63	20	50	1	87	31	151	254	45	17	103	67	59	87	5	1		23	3 530	455	3 985

Data on the residence of entering students in the 12 Canadian medical schools were not available

College Record of First-Year Medical Class

Table 23 (p 1453) presents comparative data on the college scholastic record of the entering classes in medicine since 1952 Three of the 85 schools did not report on the college record of their entering classes for 1959-1960, leaving a net 7,861 student records to be tabulated There is relatively little change in the percentage distribution for this year, although the trend toward a smaller percentage of "A" students does persist Approximately two-thirds of the first-year students had college records placing them in the 'B" group, one-sixth in the 'A" group, and one-sixth in the 'C group In 1959-1960, 33 schools had more than the average proportion (15 1%) of 'A' students and 49 schools had a smaller proportion The range was extremely wide, from 0 to 50% of 'A' students in various first-year classes Two schools reported no such students, while six schools had more than 40% of their entering class consisting of 'A' students Of the 82 schools reporting, 43 had a smaller proportion of 'C" students than the average (14 9%), while 39 had a larger proportion Five schools had no students in this category Fourteen schools had 30% or more of their first-year classes composed of students having "C college records This 30% figure represents twice the national average Of these 14 schools, 10 have geographical restrictions on choice of student body from among applicants

Such figures as given above are not subject to close scrutiny, and one must be cautious in drawing conclusions Members of admission committees are acutely aware of the fact that there are differences among colleges in the relationship of a given grade average to scholastic achievement For example, scholastic achievement in one college that is awarded a "B" grade might in another college be given a "C" grade and similarly, though perhaps to a lesser degree, in the case of "A" and "B" grades Furthermore, these variations may well occur in the same college from subject to subject and from year to year The scholastic record in college is only one factor among many considered in the selection of students by medical-school faculties

The college grade averages of students entering the first medical year of the Canadian schools in 1959-1960 is also given in Table 23 Five Canadian schools had a greater proportion than the average (14 4%) of entering students having "A" college records The range, however, for all 12 schools is 11% to 36%, with only one school having more than 30% of the class composed of "A" students Seven schools had less than the average proportion (18 9%) of "C" students The range for the 12 schools of proportions of "C" students was 2% to 47% One school had more than 30% of the class composed of such students The Canadian schools reported an increase of 8% in students in the "B" category for 1959-1960 over the previous year and a decrease of almost 5% in the number of "C" students for 1959 1960

Preprofessional Attainments of the Entering Class

Table 24 (p 1454) presents by school the preprofessional attainments of the 1959-1960 entering class Table 25 (p 1455) provides data comparing previous years with the year 1959-1960 If one considers those students who have completed four years of college together with those having a college degree, it is evident that there is a continuing trend toward a longer college preparatory period before entering medical school In 1959 1960, 81 3% of entering students had either completed four years of college or had earned one or more college degrees As Table 24 shows, there has been an increase of 6 5% of students in this category in the past five years About four-fifths of the entering classes have had such attainments during the last three years It will be of interest to watch this trend in the next few years as some schools further implement their new programs interdigitating college and medical school curricula

TABLE 20 —Geographical Source of Entering Students in Private

	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland
College of Medical Evangelists	1		1		30	6				4			2	5	1	1			1	1	2
University of Southern California			1		60									1							1
Stanford University			2		12						1	2		1	1	2	2				1
Yale University			2		1		17		1	1	1	1		2							2
Georgetown University							11	1	10	1				1	1						12
George Washington University			5		11		2		16				1	2	5	1					6
Howard University	2			1	3		1		19	2	1			[illegible]	1	6		1	1		3
University of Miami						1				76											
Emory University	3					1				16	8		1	1					2		1
Chicago Medical School					2									8							
Northwestern University	1				3	1	2		1	1		1	2	[illegible]	12	2	4	2			
Stritch School of Medicine					2		1							53	1	1	1				
University of Chicago			1	1	2	1				2				36	1		1	1			
University of Louisville					1					1				1	4			82			
Tulane University	15		1	4	2			1		15	5	[illegible]					1	5	21		
Johns Hopkins University				2	5		2	1	2	3	2	1		5	1	1	1	2			9
Boston University					1	1	4			1				1				1			
Harvard Medical School				2	10	2	4		1		1		2	10	1		2	1		1	3
Tufts University							6							1						8	
Saint Louis University			2		17	1	1		1		1	1	1	18	2	1		6			
Washington University			2	3	5	1				1		1	2	7	1	4	2		1		1
Creighton University					12		3		1			1		1		13					
Seton Hall College of Medicine and Dentistry							4														
Albany Medical College															1						
University of Buffalo							2	1													
Albert Einstein College of Medicine							2			2											
Columbia University					3	1	5	1	1						2	1		1		1	
Cornell University	1		1		4		2			1	1			[illegible]				1			
New York Medical College					3		4							1	1			2			1
New York University							2														
University of Rochester					2	1	3		1	1	[illegible]			2		1					
Duke University	1						1	1	1	9	4							2			3
Bowman Gray School of Medicine						1	1		1									4			
Western Reserve University	1				4	1	1	1	1	1				2	2	2					
Hahnemann Medical College								2	1			1		1							
Jefferson Medical College							2	2		1		1		1				2			2
Temple University								3												1	
University of Pennsylvania	1		1		1		2	1	2	2										1	2
Woman's Medical College			2		4		3					1			1						
University of Pittsburgh										1											
Meharry Medical College	[illegible]				2					10	8			1					3		
Vanderbilt University	6			1				1			2							11			
Baylor University			2	2	8	1				1	1			4		1					
Marquette University					2		1							9		4					
School of Basic Medical Sciences					2		1							1							1
Dartmouth Medical School																					
Totals	38		21	16	210	20	90	16	60	153	65	16	11	259	37	38	14	122	29	1	49

Whether or not the definition of a first-year medical student is revised from its present sense of a student who is four years removed from the M D degree will also affect the statistics on preprofessional attainment

The foregoing figures and percentages apply to the reported attainments of the entering class for 1959 1960 Each year the medical schools submit to the Association of American Medical Colleges for publication in its guidebook[7] the minimal requirements for applicants Table 26 compares these requirements for the last four years beginning in 1957-1958 There has been no great change in the number of schools requiring a college degree for admission

Medical and Basic Medical Science Schools of the United Schools

Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Puerto Rico	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Guam, Panama and Others	Canada	Foreign	Home State	Out of State	Total
	7	2		2	1	1					3	2	1		1	4	1					2	1	1			2		1			1	13	30	75	105
							1				1																1							60	9	69
1	1	1			2				1		4					1									1		1					1		42	29	71
1	3	1						1	11		19			5			5		2							1		1					2	17	63	80
18	2								3		37	1		1			5		2				1			3				1		1	1	10	103	113
	1	1			2				7	1	10			3		1	10			1			1	4		4	3	3		1		1	4	16	86	102
1	4	1	1						6		16	1		3			11			2			2										12	19	86	105
											1						3																	76	5	81
		1							1		1	1								4		2	1			1		1					1	38	39	77
3	2								9		40			1			8																	8	65	73
1	4	5		3		4			2	2	1		2	5	1	1					1		1			1	1	1	8					54	76	130
	5				2			1	1		2			5			6												3				4	53	35	88
1		1			3	3			3		5	1		6			1				1								2				2	36	37	73
									1		3			2			1										1	1					1	82	17	99
		1	11	1	1			1	2		6	1	1	2	3		3			1		4	16				1	1					5	21	111	132
4	1		1			1	1		6		10	1		3		1	2			2	1	1	4	1		2		2	1					9	69	78
29	2							3	3		15			1		1	2		1										2				4	29	43	72
13	5	6		3					8		17		1	8	1	1	5		1	1			2				1			1			2	13	103	116
58								1	5		19						4		9								1						2	58	56	114
1	4			15	3				2	1	7			16	1		4										2	1		2			2	15	98	113
1	3			19		1			1	1	5			6	6	1	1			1			5				2		3	1				19	67	86
2		4		1	1	10	1		3		3			7			4	1			2		1				3			2			1	10	67	77
3									46		24						4																	46	35	81
7									7		40			3			1		2								1						1	40	23	63
1									4		73						1																1	73	10	83
									7		76			3			3																3	76	20	96
10				1		2			6		55	2		6			7		1	1		2				2	1		3		1		4	55	65	120
2	1								9		41			4			2		1				1	1	1	1			1	1			1	41	42	83
6									12		91				1		4						1										1	91	37	128
3									17		107			1			1									1		1						107	26	133
6						1			3		38	1		4			1							1					1	1			3	38	34	72
		1							3	1	1	27					1			7		2	2			6		3						27	49	76
1	1								3		4	28		2			1		1	3		2				1							1	28	27	55
2	3	2				1			2		9			45			5		1										1				1	45	43	88
									25		2			2			75														2			75	36	111
2								1	24		5			7		1	119		2							1		3					1	119	58	177
3	1								11		1	2		3			108												1				3	108	29	137
2				1					15		5	3		2	1	1	79		1	2		1				2							1	79	50	129
3	1	1			1				5		10			1			13		1			1				1		1					1	13	38	51
									7		11			8			76			1								1					3	76	32	108
1	1		1								4	11		2	1		1			3		8	8			4							4	8	71	79
	2		3							1				2						1		18	1				1	2						18	34	52
1			1							3				3	4							2	47					1					2	47	37	84
1	2	3			2		1				5		1	19					1								3		50					50	54	104
3		2						3	2		5			1			3																	3	21	24
191	56	33	18	46	18	24	4	11	283	10	832	82	6	192	20	13	581	1	26	30	5	45	95	8	2	31	25	23	77	10	3	10	87	1 978	2 210	4 188

In 1959 1960, 3 schools admitted one student each who had completed only two years of college work The "Admission Requirements of American Medical Colleges"[7] recently published for 1961-1962 lists 77 schools requiring a minimum of three years and 6 schools requiring four years of college Of the 83 schools thus specifying three or four years, 55 recommend that the applicant be a candidate for a degree Forty-six schools indicated that some admission preference would be given to those applicants with a master's or other advanced degree

Of the 12 Canadian medical schools, the stated admission requirements of 9 are three years of college or its equivalent, while the other 3 require four years of college It is estimated that in 5 Canadian schools 75 to 100% of first-year students will have completed four years of college, three schools estimate that 50 to 74% of their students will, and three schools expect less than 50% of the entering class to have completed four years of college (one school did not report)

Students Admitted to Advanced Standing

In 1959-1960, 59 of the medical schools in the United States admitted 227 transfer students to advanced standing Of these, 118 were transfer students from two-year schools of the basic medical sciences, 83 were from four-year United States medical schools, 22 were from schools outside the United States, and 4 were from graduate schools in the United States Forty were admitted to second-year classes 183 transferred to third-year classes, and 4 students transferred to fourth-year classes

Last year the enrollment in the second year of the four schools of the basic medical sciences was reported to be 126 students Of that number, 117 (93%) were reported in the 1959-1960 list of transfer students to third-year classes One student from the basic science schools was admitted to a second-year class This group of students accounted for 52% of the total transfers in 1959-1960 Two schools took 39% of such students Harvard 24 students and Medical College of Virginia 22 students Another 31% of the students from two-year schools were accepted at six institutions Northwestern (10), Pennsylvania (7), Baylor (6), Temple (5), Jefferson (4), and Marquette (4) The remaining 35 students were accepted into third-year classes of 20 other medical schools in the United States

TABLE 21 —Out of State Enrollments of Entering Class

% of Class Non Resident	1958 1959			1959 1960		
	Number of Schools		Number of Non Resident Students Taken into Publicly Owned Schools	Number of Schools		Number of Non Resident Student Taken into Publicly Owned School
	Privately Owned	*Publicly* Owned		*Privately* Owned	*Publicly* Owned	
0		6			7	
<5		10	17		6	12
5-10	2	7	52	1	11	74
10 20	4	10	190	4	6	82
Total	6	33	259	5	30	168

The 40 students admitted to advanced standing in second-year classes of 29 medical schools consisted of 3 students whose prior medical study was undertaken abroad, 1 from a two-year basic science school, 33 from United States four-year schools, and 3 from graduate dental schools in the United States

A total of 19 transfer students from medical schools outside the United States and Canada were admitted in third-year classes of 8 medical schools The 4 transfers in the fourth year involved students from other medical schools in the United States

Of the 12 Canadian schools, 10 admitted 23 students to advanced standing Of these, 15 were transfer students to the second year and involved 8 students from other Canadian schools, 2 from United States schools, and 5 from foreign schools There were 8 transfer students admitted to third-year classes Of these, 3 were from other Canadian schools, 3 were from United States schools (2 from a two-year basic science school), and 2 from foreign schools

Combining the transfers in the United States and Canadian schools, a total of 250 students moved from one school to another, or the changes involved only 0 7% of a total student population of 33,633

Attrition of Medical Students

Attrition data for 1959-1960 were obtained directly from the medical schools in the annual questionnaire Each school was asked to report for each class those students withdrawing or being dismissed in poor academic standing and those students withdrawing or being dismissed for all other reasons The information on student loss to medicine in the United States schools is presented in Table 27 (p 1456) There appears to be little change in percentage losses compared with the figures for 1958-1959, although there are slight differences for each of the four years

As was the case in previous years, in 1959 1960 almost two-thirds (64%) of all student losses oc

TABLE 22 —Ratio of First Year Medical Students to State Populations, 1959 1960

Numbers of Students per 100,000 population* in the Approved Newly Developing Medical and Basic Science Schools of the United States	1 9
†Maine	1 9
†Nevada	2 [illegible]
†New Mexico	2 6
New Hampshire	3 0
California	3 2
†*Rhode Island*	3 [illegible]
Missouri	[illegible] 4
†Arizona	3 [illegible]
Washington	3 [illegible]
North Carolina	[illegible]
†Hawaii	3 6
Virginia	3 8
Alabama	3 8
Texas	4 1
†Delaware	4 2
West Virginia	4 2
Wisconsin	4 3
Connecticut	4 3
†Idaho	4 3
Michigan	4 [illegible]
Indiana	4 4
Oregon	4 [illegible]
†Alaska	4 [illegible]
Illinois	4 [illegible]
Kentucky	4 [illegible]
Maryland	4 [illegible]
Massachusetts	4 [illegible]
†Montana	[illegible]
Ohio	4 [illegible]
Florida	4 [illegible]
Georgia	4 8
Mississippi	4 8
†Wyoming	4 9
Kansas	[illegible] 0
Minnesota	[illegible] 0
South Carolina	[illegible] 1
Vermont	[illegible] 2
Colorado	[illegible]
Louisiana	[illegible]
South Dakota	[illegible] 4
New Jersey	[illegible]
Pennsylvania	[illegible]
Oklahoma	[illegible]
Iowa	
Tennessee	6 [illegible]
Utah	[illegible]
Arkansas	[illegible]
New York	[illegible]
Nebraska	[illegible]
North Dakota	7 [illegible]
District of Columbia	[illegible]
United States	

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* Estimated July 1 1958 total population excluding members of the Armed Forces stationed in each area Current Population Report Series P 25 No 208 Dec 7 1959

† State in which there are no medical schools

curred in the first-year class Of these losses, 63% were due to failure or withdrawal in poor academic standing This is the same figure as for last year The second year class in 1959-1960 had 65% of its losses from this cause or an increase of 6% over last year In the third-year class 44% of the losses and in the fourth-year class 33% of the losses were the result of withdrawal in poor academic standing or failure

TABLE 23 —Comparative Analysis of College Records of First Year Medical Students*

College Grade Average of First Year Medical Student	United States 1952-1953	1953-1954	1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-1960	Canada 1959-1960
36-40 (A)	18 0	21 1	16 8	1[illegible] 8	1[illegible] 1	17 7	1[illegible] 0	1[illegible] 1	11 4
26-35 (B)	67 5	68 9	69 0	70 [illegible]	[illegible]	[illegible] 0	[illegible]	70 0	[illegible]
10-25 (C)	14 [illegible]	10 0	14 2	13 [illegible]	14 0	1[illegible] 3	14 3	14 9	1[illegible]

* Based on returns from 85 medical schools

Over half (57%) of the 129 students lost to medicine in the third and fourth years left for reasons other than academic Although this is a decrease from the 73% for 1958-1959, there is still reason for concern When all four years are considered, 39% of the losses are for non-academic reasons A detailed study of the 'other reasons" for students leaving medical school despite good academic standing would be of interest

Data on the attrition of students in Canadian schools is given in Table 28 (p 1456) Data for 1958-1959 are not available for comparison Approximately 60% of these losses are due to withdrawals or dismissals because of poor academic standing The Canadian schools have a lower percentage loss in the last two years than do the United States schools

Graduates

The graduating class awarded the M D degree in 1959-1960 numbered 7,081 Inspection of Table 17 will show that this is the largest number ever to be graduated in one graduating class

All except 4 of the 81 schools in the United States having graduating classes in 1959-1960 had changes in the size of the class, 38 schools had decreases and 39 reported increases over last year Two schools, Florida and Seton Hall, had graduating classes for the first time in 1959-1960 and contributed 111 graduates to the total The two schools showing the greatest decrease over last year were Saint Louis (16%) and Louisiana State (14%) Six schools reported increases of over 15% Missouri (90%), Albert Einstein (80%), Arkansas (24%), Pittsburgh (21%), Western Reserve (18%), and North Carolina (17%)

Women made up 5 5% of the graduating class, as Table 29 (p 1457) portrays by school In eight schools, women accounted for 10% or more of the graduating class The two schools having the highest proportion of women graduates, in addition to Woman s Medical College, were the University of Puerto Rico (16%) and Howard University (14%)

Included in the annual questionnaire for this year was a request for information on the number of women students enrolled in medical schools These data are also included in Table 29 All of the four-year schools with the exception of two (Jefferson and Utah) had two or more women students enrolled in 1959-1960 Such students account for 5 6% of the total enrollment and, assuming uniform distribution among the classes, we can expect no significant increase in the number of women graduates for the next two to three years

The graduates by sex and the enrollment by sex for the Canadian schools are also presented in Table 29 Eight of the 12 schools had fewer graduates in 1959-1960 than in the previous year The largest decrease occurred in Ottawa (15 6%) Three schools showed increases in the number of graduates over last year, the largest increase being at the University of British Columbia (27%)

Women made up 7 5% of the Canadian 1959-1960 graduating class, as compared with 5 9% in the previous year In 1959-1960, 8 9% of the students enrolled in Canadian schools were women

Student Expenses

A current report on the medical schools estimates of minimum expenses for first-year students has been provided by the Association of American Medical Colleges This information is presented in Table 30 (p 1458) There appears to be little change over that previously reported As the Association emphasizes in its presentation, the figures given should be regarded as only approximate budgetary goals Medical student expenses, like all other expenses, have been gradually increasing over the past several years There is considerable range within each of the categories and the figures given in Table 30 represent median values With tuition and fees, for example, the range is from $592 to $1,500 for private schools and $120 to $786 for residents and $360 to $1,500 for nonresidents in publicly owned schools Tuition in individual schools is included in Table 1 for United States schools and in Table 2 for Canadian schools The estimated minimum expenditure for room and board, books, and supplies (excluding microscopes) does not take into account entertainment, travel, insurance, and other possible items of expense, all of which may vary greatly even in the same school and with the individual student

Table 31 (p 1458) presents information for the 12 Canadian schools on student expenses as prepared by the Association of American Medical Colleges and is comparable to Table 30 for the United States Tuition ranges from $393 to $654 for residents Although the maximum tuition is approximately $100 lower than the figure listed for 1958-1959, the median remains the same Three schools cited a nonresident fee, the highest being $859 Tuition advances in the upper years in three of the schools The considerations regarding the estimates of student expenses in the United States schools apply equally to expenses in Canadian schools

TABLE 24 —Preprofessional Education of First Year Medical Students in the United States

	Size of First Year Class	Less Than Three Years of College	Three Years of College	Four Years of College	Degree	Advanced Degree	% with Degrees
Medical College of Alabama	80		13	5	62		77.5
University of Arkansas	92		41	12	39		42.4
College of Medical Evangelists	105		1	3	99	2	95.3
University of California Los Angeles	57	1	15	3	35	3	66.7
University of Southern California	69		14	6	48	1	71.0
Stanford University	71		24		40	7	66.2
University of California San Francisco	101		42	5	51	3	53.5
University of Colorado	85		14	7	61	3	75.3
Yale University	80		6	6	66	2	85.0
Georgetown University	113		1	2	104	6	97.3
George Washington University	102		25	1	76		74.5
Howard University	105				96	9	100.0
University of Miami	81		17	12	50	2	64.2
University of Florida	49		3		44	2	93.9
Emory University	77		14	6	54	3	74.0
Medical College of Georgia	102		16	5	77	4	79.4
Chicago Medical School	73			1	68	4	98.6
Northwestern University	130		23	11	92	4	73.8
Stritch School of Medicine of Loyola University	88		34	6	48		54.5
University of Chicago	73		15	7	51		69.9
University of Illinois	200		98	19	82	1	41.5
Indiana University	182		81	21	77	3	44.0
State University of Iowa	120		58	10	47	5	43.3
University of Kansas	101			3	98		97.0
University of Louisville	99		8	2	86	3	89.9
Louisiana State University	128		54	12	62		48.4
Tulane University	132		54	12	60	6	50.0
Johns Hopkins University	78				76	2	100.0
University of Maryland	100		6	3	90	1	91.0
Boston University	72		4	3	60	5	90.3
Harvard Medical School	116		1		113	2	99.1
Tufts University	114		3		107	4	97.4
University of Michigan	196		92	7	95	2	49.5
Wayne State University	126		39	11	73	3	60.3
University of Minnesota	141		46	16	79		56.0
University of Mississippi	80		21	21	36	2	47.5
University of Missouri	75		11	6	55	3	77.3
St Louis University	113		11	10	92		81.4
Washington University	86		20	4	62		72.1
Creighton University	77		24	8	43	2	58.4
University of Nebraska	85		35	7	40	3	50.6
Dartmouth Medical School	24		18	1	5		20.8
Seton Hall College of Medicine	81		1	1	78	1	97.5
Albany Medical College of Union University	63			3	57	3	95.2
University of Buffalo	83		10	9	61	3	77.1
Albert Einstein College of Medicine of Yeshiva University	96		1	1	93	1	98.3
Columbia University	120		2		112	6	98.3
Cornell University	83		3	3	77		97.9
New York Medical College	128			2	124	2	98.4
New York University	133		8	6	117	2	89.5
State University of New York Downstate Medical Center, New York City	155		12	4	138	1	89.7
University of Rochester	72		7	1	63	1	88.9
State University of New York, Upstate Medical Center, Syracuse	83		9		72	2	89.2
University of North Carolina	69		10	7	51	1	75.4
Duke University	76		17	2	57		75.0
Bowman Gray School of Medicine of Wake Forest College	55		2	2	48	3	92.7
University of North Dakota	44		19	6	18	1	43.2
University of Cincinnati	94		4	4	86		91.5
Western Reserve University	88			3	79	6	96.6
Ohio State University	150		4	15	127	4	87.3
University of Oklahoma	101		33	14	53	1	53.5
University of Oregon	79		19	16	42	2	55.7
Hahnemann Medical College	111		10	6	90	5	85.6
Jefferson Medical College	177	1	7	2	158	9	94.4
Temple University	137		7	5	124	1	91.2
University of Pennsylvania	129		1		127	1	99.2
Woman's Medical College of Pennsylvania	51		2	1	44	4	94.1
University of Pittsburgh	108		3		103	2	97.2
University of Puerto Rico	52		5	16	30	1	59.6
Medical College of South Carolina	80		4	5	63	8	88.8
State University of South Dakota	44		11	4	26	3	65.9
University of Tennessee	203		94	17	86	6	45.3
Meharry Medical College	79		10	8	56	5	77.2
Vanderbilt University	52		16	2	33	1	65.4
University of Texas Southwestern Medical School	104		30	16	53	5	55.8
University of Texas Medical Branch	148	1	31	12	98	6	70.3
Baylor University	84		12	8	62	2	76.2
University of Utah	56		28	4	19	5	42.9
University of Vermont	52			6	44	2	88.5
University of Virginia	76		3	2	70	1	93.4
Medical College of Virginia	84		12	2	69	1	83.3
University of Washington	78		20	7	50	1	65.4
West Virginia University	45		1	3	40	1	91.1
University of Wisconsin	88		52	1	32	3	39.8
Marquette University	104		2	7	85	10	91.3
Totals	8,173	3	1,524	507	5,919	220	75.1

International Educational Exchange in Medicine

In order to provide an appropriate setting for a discussion of educational exchange in medicine, the following excerpt is quoted from the introductory paragraphs of *Open Doors 1960*,[8] the most recent report on international exchange published by the Institute of International Education.

The results of the six surveys conducted by the Institute of International Education during the academic year 1959-1960 indicate that there has been continued interest in international educational exchange. The statistics in Open Doors show that there are more foreign students, faculty members and physicians studying in the United States than ever before.

There were 65,328 foreign citizens on educational assignments in the United States this year. Of those, 48,486 were students, 2,539 scholars, lecturers or researchers who had received appointments to American faculties, 9,457 were interns and residents affiliated with United States hospitals, and 4,846 trainees with United States business and industry.

The 65,328 foreign citizens reported in Open Doors 1960 come from every major geographic and political area. The largest number of exchangees, 22,422, 34.3% of the entire foreign population surveyed, are from the Far Eastern countries. 12,346 nationals of Latin America, 18.9% comprise the second largest group and 11,129, 17%, are from Europe, 9,165, 14%, are from the Near and Middle

East 6 810 from North America (Bermuda and Canada) and 2 314 from Africa

The foreign nationals listed in Open Doors are citizens of other countries who have come to the United States for education and training and who plan to return home upon completion of their assignment Displaced persons who may be settling in the United States and foreign citizens who are establishing permanent residence in the United States are not included Primary and secondary school teachers are not included in Open Doors

During the academic year 1959-1960 9,457 foreign physicians from 92 countries were training in hospitals throughout the United States, 6,912 trained as resident physicians and 2 545 as interns These figures represent a 13% increase over the 8,392 physicians reported last year and almost double the number reported in the first IIE survey of foreign physicians in 1954-1955 In that year 5 036 foreign physicians were with United States hospitals

The Institute s report indicates that of the more than 48,000 foreign students in the United States the most were enrolled in courses in engineering (11,000) and least in agriculture (1,615) Of particular interest are the approximately 600 foreign students enrolled in premedical studies, 1,048 in medicine (undergraduate and graduate but excluding internship and residency), and 1,847 enrolled as undergraduate or graduate students in the general field of biological sciences

Visiting Foreign Scholars on Faculties of United States Educational Institutions

The Institute reported that during the 1959-1960 academic year, 2,539 foreign professors, instructors, lecturers, and advanced research scholars were affiliated with 278 United States colleges and universities This is the second year that the number of foreign faculty members in the United States has been greater than the number of United States faculty members reported on educational assignments abroad There were 1,777 faculty members from 339 United States colleges and universities on research or training assignments in 87 countries

The largest group of visiting foreign faculty members (1,146) was in the natural and physical sciences There were 544 scholars, almost twice as many as last year, who served on medical faculties, and 297 were in the various fields of the humanities The Far, Near, and Middle Eastern, European, and African scholars were predominantly in the natural and physical sciences Latin and North American scholars predominated on the medical faculties

Of the United States faculty members abroad, the humanities, the social sciences, and the natural and physical sciences were the leading fields of interest Education, medicine, engineering, agriculture, and business administration followed in that order

Foreign Students in Medical Schools in the United States and Canada

In 1959-1960 there was a total of 372 foreign students enrolled in United States Medical Schools (Table 32) These students represented 68 countries Included in this figure are 113 students enrolled in the entering class Table 33 gives for six years the number of students from foreign countries admitted to medical schools in the United States as entering students in the first-year class

TABLE 25 —Comparative Data About Preprofessional Education of Classes Entering Medical School

	1954-1955 %	1955-1956 %	1956-1957 %	1957-1958 %	1958-1959 %	1959-1960 %
Entering with degree	71.1 } 74.9	69.9 } 74.8	72.9 } 77.4	75.6 } 79.2	73.8 } 80.4	75.1 } 81.3
Entering after four years of college	3.8	4.9	4.5	3.6	*6.6	*6.2
Entering after three years of college	24.8	25.1	22.4	20.6	†19.5	†18.6

*112 or more semester hours or 163 or more quarter hours
†89-111 semester hours or 123-163 quarter hours

The 12 medical schools in Canada enrolled 473 foreign students from 38 countries, the majority coming from the United States The areas represented and the number of students from each area are included in Table 34

United States Citizens Studying Medicine Abroad

There appears to be no accurate calculation available of the number of United States students studying medicine abroad However, it has been possible for the past several years to collect data pertaining to the number of American-born graduates of medical schools outside of the United States and Canada who have received their initial medical licenses in the United States Table 35 records accumulated figures from 1950-1954 and yearly data for succeeding years Beginning in 1956, when returns were available from all states, it will be noted that the figure is steadily increasing, showing an increase of 82 in 1959 over the previous year

TABLE 26 —Comparison of Admission Requirements for Classes Entering in Years 1957 1958 Through 1960 1961

Stated Admission Requirement	Number of Schools 1957 1958	1958-1959	1959-1960	1960-1961
Less than three years of college	1*	1*	1*	1*
Three years of college	73	74	72	71
Four years of college	4 } 11	8 } 10	10 } 12	10 } 13
Degree	7	2	2	3
	85	85	85	85

* The same school in each instance which has actually not admitted any first year medical students with less than three years of college during at least the past five years

Reports of Other Organizations Pertinent to Medical Education

The American Medical Education Foundation

On April 15, 1960, the American Medical Education Foundation made grants from the 1959 income of $1,198,287, to the 85 medical schools in the United States. Of these contributions, $789,514 was in the form of earmarked gifts from physicians to specified schools. The balance was distributed equally. This brought the total that the Foundation has raised and distributed from the medical profession to $9,072,553 since 1951.

The American Medical Education Foundation, sponsored by the American Medical Association, which pays all of the cost of AMEF's administration and promotion, has developed a deep interest for the financial problems of medical education in most of the state and county societies across the country. A corollary interest in the educational problems of these schools has also been developed while presenting the schools' monetary needs.

TABLE 27.—*Attrition in Medical Schools in the United States (85)*

Year	Enrollment	Withdrawal or Dismissal in Poor Academic Standing	Withdrawal or Dismissal for Other Reasons	Total	Enrollment Lost %
First	8,173	401	236	637	7.8
Second	7,563	155	81	236	3.1
Third	7,214	48	60	108	1.5
Fourth	7,134	7	14	21	0.3
	30,084	611	391	1,002	3

The activities of the Foundation, in its effort to stimulate giving, have been brought to the attention of the entire profession. Editorials have been printed in every medical journal in the United States. Advertisements have been run in a great number of these journals. Exhibits have been displayed at many state and national medical meetings. The officers and the staff of the Foundation have spoken in general meetings and to the houses of delegates of a large majority of the societies. The state chairmen and committeemen have presented the urgent needs of the schools to county meetings and in reports to state societies.

The national office has sent two or three mailings a year to the entire profession and distributed brochures and promotional material to the state societies, who, in turn, have made many mailings themselves. With the help of the Foundation staff and the executive staffs of the state associations, highly organized solicitation campaigns have been conducted in many states. Six states now have a compulsory item on their dues bill for the American Medical Education Foundation. Six others include this as a voluntary item on their dues statement. Surprisingly, the physicians in these states that use the dues statement method are at least as enthusiastic about the program as those that go to great efforts of voluntary campaigning.

During the past three years the Foundation has also worked out coordinated programs of various natures with several of the medical schools themselves. Particularly successful in this has been the Georgetown-AMEF joint appeal.

On many of the state campaign committees, and on some of the local campaign committees, representatives from the medical schools, such as deans, assistant deans, or faculty members have been asked to serve. This has resulted in greater cooperation and understanding between the societies and the schools. One outstanding example of this has been in a city in the south where some misunderstandings were resolved in the joint efforts put forth by all for the AMEF program.

The Foundation has also assisted the schools by collecting and tabulating the results of the appeals to physicians from the schools themselves. Last year $3,157,073 in contributions from 55,924 physicians were recorded in the Foundation office. An important policy of the Foundation—the emphasis on unrestricted gifts—has been adopted as a responsibility which the Foundation has continued to publicize.

TABLE 28.—*Attrition in Medical Schools in Canada (12)*

Year	Enrollment	Withdrawal or Dismissal in Poor Standing	Withdrawal or Dismissal for Other Reasons	Total	Enrollment Lost %
First	946	68	34	102	10.8
Second	882	14	9	23	2.6
Third	863	2	5	7	0.8
Fourth	858				
	3,549	84	48	132	

It is hoped that the Foundation's continued insistence on unrestricted gifts will assist the schools in securing similar releases from other sources of support.

The Foundation's grants are made without stipulation, or rather, it is stipulated that they are to be used as the dean and the medical school administration feel they are most needed. In addition, it is emphasized that the grants are extra budgetary in nature and are to be considered as support for programs where no other moneys are available, or as an increment to inadequate appropriations from basic sources.

National Fund For Medical Education

The accompanying resume has been submitted by the staff of the National Fund for Medical Education to acquaint readers with the current activities of the Fund in support of medical education.

In April, 1960, the National Fund for Medical Education awarded Class "A" and "B" grants totaling $2,970,180 to the nation's accredited 83 medical schools for support of their teaching budgets. In addition, in May, they awarded $50,000 in developmental and special purpose grants to a selected group of schools for the purpose of exploring ways and means to assist their teaching efforts. These grants bring to approximately $22,000,000 the total distributed by the Fund since its first grants were made in 1951.

Each four-year school received $15,000 plus $60 per undergraduate medical student. The four two-

TABLE 29 —Distribution of Students and Graduates in the United States and Canada by Sex

	Students		Graduates	
United States	Men	Women	Men	Women
Medical College of Alabama	271	29	62	9
University of Arkansas	393	10	85	1
College of Medical Evangelists	351	27	85	
University of California Los Angeles	198	20	44	5
University of Southern California	250	16	60	4
Stanford University	220	16	54	3
University of California San Francisco	325	33	72	7
University of Colorado	295	17	66	5
Yale University	287	16	67	5
Georgetown University	394	10	101	1
George Washington University	363	29	89	8
Howard University	390	35	55	10
University of Miami	261	12	54	2
University of Florida	166	11	37	3
Emory University	283	10	68	3
Medical College of Georgia	351	14	82	6
Chicago Medical School	265	2	61	1
Northwestern University	503	17	125	7
Stritch School of Medicine	314	12	76	3
University of Chicago	279	20	71	4
University of Illinois	689	42	156	14
Indiana University	579	22	128	4
State University of Iowa	422	14	98	5
University of Kansas	379	14	93	5
University of Louisville	361	14	86	3
Louisiana State University	412	25	89	6
Tulane University	488	11	117	1
Johns Hopkins University	305	17	57	6
University of Maryland	353	16	81	3
Boston University	255	25	65	6
Harvard Medical School	479	20	137	6
Tufts College Medical School	417	21	96	7
University of Michigan	686	34	170	7
Wayne State University	353	22	55	4
University of Minnesota	486	28	118	4
University of Mississippi	262	12	62	1
University of Missouri	255	13	58	1
Saint Louis University	409	11	93	4
Washington University	328	16	81	4
Creighton University	267	4	64	1
University of Nebraska	304	10	76	4
Dartmouth Medical College	48			
Seton Hall College of Medicine and Dentistry	277	22	65	6
Albany Medical College	226	12	51	3
Albert Einstein College of Medicine	341	28	86	4
Columbia University	430	42	105	11
Cornell University	314	21	82	4
New York Medical College	466	24	106	6
New York University	461	56	114	14
State University of New York Downstate Medical Center New York City	524	44	122	12
University of Rochester	264	12	56	3
State University of New York Upstate Medical Center Syracuse	287	15	68	5
University of North Carolina	260	6	67	2
Duke University	306	6	71	3
Bowman Gray School of Medicine	192	22	48	5
University of North Dakota	79	2		
University of Cincinnati	336	16	80	7
Western Reserve University	306	26	77	8
Ohio State University	536	32	134	3
University of Oklahoma	350	11	81	4
University of Oregon	291	13	69	3
Hahnemann Medical College	373	13	84	6
Jefferson Medical College	659		163	
Temple University	486	35	119	6
University of Pennsylvania	499	22	128	3
Woman's Medical College of Pennsylvania		185		40
University of Pittsburgh	301	18	93	4
University of Puerto Rico	168	27	35	7
Medical College of South Carolina	285	14	69	1
University of South Dakota	77	3		
University of Tennessee	739	21	182	5
Meharry Medical College	239	25	57	7
Vanderbilt University	19	10	44	4
University of Texas Southwestern	378	22	98	3
University of Texas Galveston	482	25	132	8
Baylor University	317	13	66	1
University of Utah	203		44	
University of Vermont	175	9	40	2
University of Virginia	277	10	63	2
Medical College of Virginia	333	18	88	7
University of Washington	275	13	68	4
West Virginia University	78	4		
University of Wisconsin	314	28	69	4
Marquette University	378	15	86	3
Total	28 274	1 710	6 676	405
Canada				
University of Alberta	201	12	49	1
University of British Columbia	192	22	50	6
University of Manitoba	189	12	53	1
Dalhousie University	204	13	46	4
Queen's University	294*	39*	45	7
University of Ottawa	233	31*	39	4
University of Western Ontario	218	16	52	2
University of Toronto	527	73	121	17
McGill University	378	36	89	6
University of Montreal	405	31	94	7
Laval University	476	32	135	6
University of Saskatchewan	112	14	25	4
Totals	3 379	331	798	65

* Premedical Students included

year medical schools of the basic medical sciences received $7,500 each, plus $60 per student

The Fund's grants were made possible through the generosity of some 2,682 corporations, foundations and individuals who contributed $2,221,828, as well as through a Ford Foundation grant of $985,313

In May, 1960, the Fund awarded its first grants under its new Medical Research Program through which contributions from united funds, community chests and other interested groups are channeled into basic medical research Each of the 85 medical schools in the country—including Seton Hall College of Medicine and Dentistry, and the University of Florida College of Medicine, which did not share in the "A' and B' grants since they have not yet graduated their first four-year class—was awarded an institutional grant of $7,500 for support of basic research The Fund's Medical Research Program aims to help support and to stimulate a continuing search for new medical knowledge and to increase the number of trained medical researchers in the nation by fostering and encouraging young men and women interested in basic research Approximately 150 local united funds contributed to the Medical Research Program during its first year The $615,000 awarded under the Medical Research Program is the beginning of what the Fund hopes will lead to much larger grants in the near future

The Fund's Program among the nation's corporations continued unabated with some 2,682 corporations and individuals making donations through the Fund During 1959 many corporations regularly supporting the Fund increased their gifts so that contributions in that year rose 8 5% over the previous year

In 1960 the Fund marks the Tenth Anniversary of its grants Its immediate object is to broaden the base of support, to carry its message to more parts of the country and to a growing number of corporations To this end it is intensifying its activities in all major cities and in industry The medical schools face a formidable task during the next decade They must maintain the highest standards during a period of expansion and readjustment created by our rapidly increasing population, the great growth of scientific knowledge and the demand for better health services by most of the population The National Fund is dedicated to helping the schools meet this challenge

TABLE 30 —Estimates of Median Minimum Expenses for First Year Medical Students in the United States*

Item	Private Schools (N=45)	Public Schools (N=41) Resident	Public Schools (N=41) Nonresident
Tuition and fees	$1,110	$525	$900†
Room and board	900	780	780
Books and supplies (not including microscopes)	150	145	145

* Reprinted from "Admission Requirements of American Medical Colleges (Including Canada) 1960-1961," for applicants to the 1961-1962 class Published by the Association of American Medical Colleges Evanston, Ill *including newly formed University of Kentucky School* of Medicine, Lexington, because it will accept students for classes beginning September 1960

† Excluding one school that accepts no nonresidents in the first year class and one *school that accepts no nonresidents* at all Two private schools cite higher tuition for nonresidents

The National Science Foundation

The following résumé of the activities of the National Science Foundation, insofar as they are related to medicine through grants for basic research in the medical sciences, grants for short-term medical research conferences and symposia supported by the foundation, and fellowships for study at the graduate and postgraduate level, has been submitted by the foundation

The National Science Foundation, an agency of the Federal Government, was established by Congress in 1950 'to promote the progress of science, to advance the national health, prosperity, and welfare, to secure the national defense, and for other purposes" Now celebrating its tenth anniversary, the Foundation supports basic research in all the sciences and conferences and symposia on special aspects of science, administers programs to improve science education, studies scientific manpower supply and demand, supports programs for making scientific information more readily available, and compiles data on the national effort in scientific research and development

TABLE 31 —Estimates of Median Minimum Expenses for First Year Medical Students in Canadian Schools (Canadian Dollars)*

First-year Expense Item	Median Amount Cited by Medical Schools of Canada
Tuition and fees (resident)	$545
Room and board (minimum)	632
Books and supplies (not including microscopes)	117

* Reprinted from "Admission Requirements of American Medical Colleges (Including Canada), 1960-1961," for applicants to the 1961-1962 class, published by Association of American Medical Colleges Evanston, Ill

Statistical background on Foundation programs of special interest to the medical profession is shown in table 36

TABLE 32 —Foreign Students in Medical Schools in the United States

Area	Countries No	Students No
Far East	12	99
Near and Middle East	7	19
Europe	14	68
Latin America		
Caribbean	8	65
Central America	6	22
South America	7	42
North America	2	20
Africa	10	30
Oceania	2	7
Total	68	372

Basic Research —In fiscal year 1960, $63 million was available to the Foundation for the support of basic research in the mathematical, physical, engineering, medical, biological, and social sciences, and $16 million for the construction and maintenance of research facilities Of this sum, approximately $25 million was expended in support of research in the life sciences, with $2 8 million set aside for specialized biological facilities

Programs of basic research support are carried on in the fields of developmental, environmental, genetic, metabolic, molecular, psychobiology, regulatory, and systematic biology Preclinical research, but not clinical, is supported

Short-Term Medical Research —In an effort to increase the number of scientists qualified to perform basic research in medical fields, the Foundation sponsors a program designed to encourage medical school students to pursue careers in research

Medical school students constitute one of the largest sources, relatively untapped, of medical research scientists The medical curriculum is essentially instructional, offering little, if any, opportunity for students to pursue research and become familiar with its methods or challenges The Foundation seeks to introduce medical students to the techniques of basic research by means of its grants to medical schools for the support of short-term research by students during free-quarter periods Without interfering with the medical curriculum

TABLE 33 —Foreign Citizens Enrolled in Entering Class of Medical Schools of the United States

School Year	No Foreign Students in Entering Class
1954-1955	91
1955-1956	97
1956-1957	92
1957-1958	73
1958-1959	110
1959-1960	113

the program provides opportunities for carefully selected students to determine their interest in and aptitude for research Student research is conducted under the supervision of qualified members of the medical school staff

TABLE 34 —Foreign Students in Medical Schools in Canada

Area	Countries, No	Students No
Far East	6	50
Near and Middle East	2	8
Europe	11	29
Latin America		
Caribbean	4	69
Central America	1	1
South America	3	8
North America	2	301
Africa	7	9
Oceania	2	3
Total	38	473

In 1956, the Foundation began this program experimentally In the years of its operation, the program has expanded considerably and now includes 66 medical schools in the nation Over $1,000,000 has been granted for this purpose

Conferences and Symposia —Selected conferences and symposia are supported by the Foundation at the request of a cosponsoring institution or society These meetings provide an opportunity for experienced investigators to exchange information and enable younger investigators to glean ideas and advice from some of the world s foremost scientists Of the 43 conferences supported during the year, 11 were of interest to the medical profession

TABLE 35 —Initial United States Licenses Issued to American Graduates of Foreign (Excluding Canada) Medical Schools

Year	No of Licenses Issued	No of States
1950-1954	99	20
1955	89	19
1956	103	15
1957	212	17
1958	284	26
1959	366	23

Data not available for New York and Pennsylvania

Additional information on the support of research grants in the biological and medical sciences may be obtained from the Division of Biological and Medical Sciences, National Science Foundation, Washington 25, D C

Fellowships —The Fellowships Programs of the Foundation are designed to strengthen the Nation's scientific potential by providing support for advanced training in the sciences directed toward the development of highly qualified scientists and for further study in the sciences directed toward increasing the competence of college science teachers

Fellowships are offered for graduate study in the physical, medical, biological, and engineering sciences, anthropology and psychology (excluding clinical), certain interdisciplinary fields, and in selected social science fields (in all except Science Faculty Fellowship program) These fellowships are limited by law to citizens of the United States A Fellow may study under his award at any accredited nonprofit American or nonprofit foreign institution of higher education

Awards are not made to individuals to pursue a course of study designed to prepare them for careers in medical practice or other clinical fields, nor for support of residency training or similar work leading to qualification in a clinical field Applications are accepted, however, from students who intend to obtain advanced training in one of the medical sciences directed toward a career in research An individual who holds a degree such as M D , D D S , or D V M and desires to continue training for a career in research is eligible to apply for a postdoctoral award provided he can present an acceptable plan for study and research

Six fellowship programs are offered—graduate, cooperative graduate, summer fellowships for graduate teaching assistants, postdoctoral, senior postdoctoral, and science faculty The Foundation is assisted in evaluating fellowship applicants by panels of leading educators and scientists drawn from throughout the United States

TABLE 36 —NSF Support of Activities (Research and Conferences) of Interest to the Medical Profession

	Fiscal Year 1959		Fiscal Year 1960	
	No	Amt $	No	Amt $
Basic medical research grant	122	3 391 250	390	13 716 550
Short term research by medical students	30	364 600	18	295,560
Conferences and symposia on subjects of medical interest	1	25 000	11	99 23

Graduate fellowships intended to support students of high ability in pursuing scientific studies provide stipends of $1,800 to $2,200 for a 12-month period (or 75% of annual stipend for 9 months) Those working toward a Master's or Doctor's degree in science, and senior undergraduate students are eligible to apply NSF will provide tuition, fees, and allowances for travel and dependents During 1959, 1,200 graduate fellowships were offered The Cooperative Graduate program provides stipends of $2,200 and differs in certain operational aspects from the regular graduate program During fiscal year 1960 1,900 were offered The Graduate Teaching Assistants program provides stipends ranging from $50 to $75 per week and is administered by cooperating graduate institutions for their own graduate teaching assistants During fiscal year 1960, support was offered to 580 students

The Postdoctoral program provides a stipend of $4,500 with allowances for travel and dependents for qualified applicants who have earned a doctoral degree or have had equivalent research training and experience These awards are made semiannually, and 180 were offered in fiscal year 1960

Scientists who have held their doctoral degree for a minimum of five years are eligible for Senior

Postdoctoral fellowships to assist them in broadening their knowledge Stipends of a salary matching type are based on the fellow's "salaried income" not to exceed $12,000 for a 12-month period Travel allowances were available to the 75 scientists who were offered the award in fiscal year 1960

Science Faculty fellowships were awarded to 285 teachers in fiscal year 1960 to aid them in increasing their effectiveness as educators They receive stipends of a salary matching type based on the fellow's "salaried income" not to exceed $12,000 for a 12-month period, with travel and additional allowances Applicants must hold a Baccalaureate degree or its equivalent and have had three years or more academic experience in teaching science Five hundred secondary school teachers were offered summer fellowships to enable them to undertake study programs in science The fellows received stipends of $75 per week

The NATO Postdoctoral Fellowships in Science program is administered in the United States by the Foundation at the request of the Department of State Designed to stimulate the exchange of scientists among the NATO countries, 41 awards, 18 of them for study and research in the life sciences, were made in the past year

The Foundation also has the responsibility for administering the Organization for European Economic Cooperation Senior Visiting Fellowship program in the United States Twenty-seven fellowships, 12 of them in the life sciences, were awarded last year to assist institutions in incorporating recent world-wide developments into their own programs

During fiscal year 1960, 63 fellowships were awarded in the medical sciences There were 19 graduate, 16 cooperative graduate, 9 graduate teaching assistants, 17 regular postdoctoral, and 8 science faculty In addition, 114 were offered awards in biochemistry, 20 in biophysics, 160 in general biology, 56 in genetics, 29 in microbiology, and 239 in zoology These are the classifications of the applicants themselves

Additional information on the various fellowship programs of the National Science Foundation may be obtained from the Fellowships Section, Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D C

Educational Values of the Grants and Training Awards Programs of the United States Public Health Service

Because of their rapid growth since 1945 and their contribution and impact on undergraduate medical education, graduate education and training, and on the research activities and potentials of medical schools, any current report on Medical Education in the United States would be incomplete without presentation of the educational values of the grants and training awards programs of the United States Public Health Service The following information reviewing the current status of these programs was prepared and submitted by the Public Health Service, United States Department of Health, Education, and Welfare

The United States Public Health Service conducts several programs of interest to the field of medical education Programs of grants and training awards in the medical and related sciences help add to the Nation's supply of trained personnel in the life sciences These programs are of several types (1) research fellowships, (2) training grants, (3) research grants, and (4) health research facilities construction grants In addition, the Public Health Service administers traineeship programs for professional nurses and public health personnel Finally, the Service conducts a number of intramural training programs in its own hospitals and research centers

The research grants and awards programs are administered through the bureau of the Public Health Service primarily concerned with research, the National Institutes of Health Although research is conducted at the NIH laboratories in Bethesda, Md , the major portion of the annual appropriations—over two-thirds in recent years—help support research studies, training, and construction in nonfederal institutions In fiscal year 1960, grants and contracts for these purposes amounted to $360,000,000, about one-half of which supported activities in the medical schools

A wide range of medical and biological investigations and of training activities is aided by the Institutes National Cancer Institute, National Heart Institutes, National Institute of Allergy and Infectious Diseases, National Institute of Arthritis and Metabolic Diseases, National Institute of Dental Research, National Institute of Mental Health, and National Institute of Neurological Diseases and Blindness In addition, the NIH's Division of General Medical Sciences administers a program of grants for training and research studies not falling within the categories of the seven Institutes The Division of Research Grants provides central review and processing for all the grants programs of the National Institutes of Health, has important functions with regard to research fellowships programs, and administers grants for the construction of health research facilities

Nine national advisory councils, established by law and composed of nonfederal leaders in medical science, education, and public affairs, review all grant applications within their respective areas and recommend action to the Surgeon General of the Public Health Service The councils are assisted by nearly 40 study sections—panels of outstanding specialists, mostly nonfederal—who provide initial review of research project applications for scientific merit In addition to these specific functions, the councils and study sections, as well as various spe cil committees and review groups, contribute over-all guidance to the research grant and training activities

These and other kinds of Public Health Service programs of interest to medical education through both direct and indirect educational relationships are presented in the following brief summaries (Further information may be obtained from the Division of Research Grants National Institutes of Health, Bethesda 14, Md)

Research Fellowships

Research fellowships are intended to increase the number of scientists qualified to carry on independent research Five types of fellowships are available

1 *Predoctoral Research Fellowships*—Predoctoral research fellowships are awarded to students with a bachelor's degree or equivalent, for the pursuit of graduate research training in the fields related to health Stipend rates are $1 800, $2,000, and $2,200 for the first, second, and third years, respectively Allowances for dependents, travel, and tuition are added to the stipend Up to $250 may be paid to the sponsoring institution to defray unusual expenses In addition to this regular award predoctoral fellowships are available to the student in professional school who wishes to engage in part-time research and to the medical or dental student who is willing to drop out of regular courses for one two, or three years for intensive research training prior to obtaining the professional degree Stipends for these programs vary

All full time fellowships to prepare nurses for independent research are special predoctoral fellowships Stipends are set according to individual estimate of living and educational expenses

2 *Postdoctoral Research Fellowships*—Postdoctoral research fellowships are awarded to qualified persons holding a doctor's degree in medicine, dentistry, or related fields Stipend rates are $4,500, $5,000, and $5,500 for the first, second, and third years, respectively Allowances for dependents, tuition, and travel are added to the stipend An allowance of $500 may be paid to the sponsoring institution to help defray unusual expenses

3 *Special Research Fellowships*—Special research fellowships are awarded to qualified scientists who have demonstrated unusual competence in research or who require specialized research training that does not fit the other fellowship categories The stipend, including necessary allowances, is determined at the time of the award An allowance of $500 may be paid to the sponsoring institution to help defray unusual expenses

4 *Senior Fellowship Grants*—Senior fellowship grants are awarded to schools of medicine, dentistry, and public health and to other appropriate institutions, in support of competent scientists who wish to conduct research and teach These fellowships are intended (1) to encourage and support the development of professional personnel for academic and research careers, and (2) to aid in stabilizing research careers The awards are made for five-year periods, are renewable, and provide for salary plus partial research expenses not exceeding $7,500 Senior research fellows may also apply for additional support for their research needs

5 *Foreign Research Fellowships*—Foreign research fellowships are awarded to a limited number of scientists who wish to study in United States laboratories The purpose of the program is to provide an opportunity to strengthen medical research by mutual exchange of research methods, scientific philosophy, and cultural values Nominations are made by respective national research organizations in each western European country Candidates must have (*a*) completed a doctoral degree in one of the medical or related sciences and demonstrated proficiency in research, (*b*) made satisfactory arrangements with the laboratory in the United States where training will be obtained, and (*c*) acquired a workable reading and speaking knowledge of the English language Scientists will be brought to the United States on an exchange visitor's visa, which requires return to the homeland for a period of at least two years at the end of the training period The basic stipend is $4,500 per year Dependency, travel, and certain other allowances are added to the stipend

Training Grants

The objective of the training grants program is to increase the nation's supply of trained personnel in the medical science fields with which NIH is concerned This is done by assisting in the establishment, expansion, and improvement of training programs in universities and other institutions Aid to the institution is provided by grants in two general classes—undergraduate and graduate

1 *Undergraduate Training Grants*—Undergraduate training grants are awarded to schools of medicine, osteopathy, dentistry, nursing, and public health to assist in developing expanded and better-integrated undergraduate instruction relating to the prevention, diagnosis, and treatment of cancer, mental illness, and cardiovascular diseases It is the responsibility of the institution to determine the most appropriate use of the funds

2 *Graduate Training Grants*—Graduate training grants are awarded by all the Institutes and by the Division of General Medical Sciences to public and private nonprofit institutions for training research investigators, teachers, and, in scarce personnel categories, personnel for medical service Funds may be used to improve facilities and to provide salaries for faculty and staff, stipends for individuals in training, money for travel, and necessary supplies and materials

Special new training grants programs are being established in fields of special need

Public Health and Professional Nurse Traineeships

The public health traineeship program of the Public Health Service supports graduate and specialized public health training for individuals who have completed their basic professional education and plan employment in the field of public health Awards are made directly by the Public Health Service, by schools of public health, and by nursing schools that prepare graduate nurses for beginning positions in public health These traineeships are awarded to physicians and to members of other professions who engage in public health work, such as dentists, veterinarians, nurses, sanitary engineers, health educators, sanitarians, nutritionists, and others The traineeships include payment of stipends, tuition and fees, and certain travel expenses About 650 traineeships are awarded each year, approximately one-half of which support public health training for nurses

A limited number of similar traineeships are available to professional personnel who are or plan to be engaged in the prevention and abatement of community air pollution These traineeships support specialized training related to the effects, extent, assessment, or control of air pollution

Applications for public health or air pollution traineeships may be obtained from any of the regional offices of the Public Health Service or from the Chief, Division of General Health Services, Bureau of State Services, Public Health Service, Washington 25, D C

The professional nurse traineeship program provides traineeships for nurses preparing for administrative, supervisory, and teaching positions Stipends of $2,400 to $3,600 plus tuition, certain travel fees, and dependency allowances of $360 per annum are available through collegiate schools of nursing and public health departments, participating in the program In addition, funds were first awarded in 1959, through nonprofit agencies offering approved courses, for nurses who seek short-term training in order to improve their administrative, supervisory, or teaching skills Tuition and fees, as established by the sponsoring agency, are provided, and a daily stipend of $12 may be allowed for trainees who must temporarily change their residence in order to enroll in the course This program is administered by the Division of Nursing, Bureau of State Services

Research Grants

Research grants are made to universities, medical schools, hospitals, laboratories, and other public or private institutions and to individuals for support of research in health, medicine, and allied fields The major objectives are to expand medical and biological research in scientific institutions throughout the country and to stimulate new investigations in fields needing exploration The program also provides training, indirectly, for the scientific personnel engaged in the research work The funds provide for salaries, equipment, supplies, travel, overhead, and certain other expenses

Each Institute makes grants for research within its area of interest, and a general NIH appropriation supports studies outside the scope of the seven Institutes' programs

In fiscal year 1960, approximately 11,690 research grants totaling $199,000,000 were awarded from NIH funds in the United States and abroad Some 6,300 professional papers will be published by research grantees in a wide variety of journals as a result of this work

Field investigation grants, awarded by the National Cancer Institute, support developmental research, community studies, and surveys that will contribute to the prevention, control, diagnosis, and treatment of cancer in the general population

Health Research Facilities Grants

Under the Health Research Facilities Act of 1956, the Congress authorized a program to assist in the construction of laboratories and other facilities for the conduct of health research The program provides grants-in-aid on a matching basis to public and private nonprofit institutions The amounts of federal funds awarded may not exceed 50% of the total costs of the research portion of the facility, and the remaining sum must be provided from nonfederal sources Each year since 1956, the sum of $30,000,000 has been appropriated for this program, and several hundred awards have been made to institutions in all parts of the country As a result, many new research facilities are now in operation

Training for Public Health Service Careers

The Public Health Service, in its widespread and diversified programs, offers many career opportunities to competent physicians Training is provided in various areas of medicine, including patient care, clinical research, basic laboratory research, epidemiology, preventive medicine, quarantine duty, foreign service, and public health administration

Most of the Service's physicians are officers in the Commissioned Corps, which has served this country with distinction since 1873 A young physician or medical student may enter the Corps (1) through the Commissioned Officer Student Training and Extern Program (COSTEP), (2) as an intern upon graduation from medical school, and (3) as a medical officer after nonservice internship

Clinical assignments are available in most of the Service's 15 general and special hospitals and in many of its 52 hospitals for American Indians and Alaskan natives Postgraduate medical education in the teaching hospitals is conducted by chiefs of service (who are certified or eligible for certification by their specialty boards), with the assistance of well qualified personnel and outstanding consultants from local hospitals and medical schools Approved internships are also offered in dentistry, dietetics, and pharmacy

Rotating internships consisting of assignments planned to round out a young physician's education are available in the Service s hospitals at Baltimore, New Orleans, New York, Norfolk, San Francisco, Seattle, and Boston The schedule provides four months of medicine four of surgery, two of pediatrics, and two of obstetrics

Straight one-year internships in surgery and in internal medicine are available at the USPHS Hospital on Staten Island, New York City, beginning July 1, 1961

In addition to the usual educational requirements, the applicant for appointment as a medical intern must (1) be in good health, (2) be an American citizen, and (3) submit an application for a reserve commission in the Public Health Service Those who have satisfactorily completed the year's internship may apply for continuing assignment with the Service They are eligible to take the examination for appointment in the regular corps

In addition to the internships, Public Health Service hospitals offer approved residency training in the following medical specialties general surgery, general practice, internal medicine, orthopedic surgery, urology, anesthesiology, dermatology and syphilology, ophthalmology, obstetrics and gynecology, pathology, radiology, and psychiatry The National Institutes of Health s Clinical Center, a 500 bed research hospital at Bethesda, Md , offers residency training in internal medicine, neurology, ophthalmology, pathology, psychiatry, and radiology Any physician may apply for appointment, but most candidates are selected subject to eligibility for the Commissioned Corps

Through the Commissioned Officer Residency Deferment (CORD) program, Public Health Service offers qualified physicians the opportunity to obtain deferment from the military service under the Universal Military Training and Service Act Physicians are commissioned in the Reserve Corps of Public Health Service and deferred from active duty to obtain residency training in essential specialty fields After completion of training, participants must serve their obligatory time with the Public Health Service No additional military service is required

The program known as COSTEP operates on a year-around basis, providing employment for a limited number of medical and dental students at Public Health Service hospitals, research laboratories, and other facilities The bulk of these positions are open during the summer months Appointments are offered to students who will have completed their sophomore year of professional education by July 1 and are interested in becoming reserve officers in the Commissioned Corps

Clinical and basic research in United States Public Health Service hospitals includes both individual projects and projects undertaken cooperatively by several hospitals The Division's clinicians may apply for direct grants-in-aid from the National Institutes of Health A number of the investigative studies conducted at USPHS hospitals are associated with research activities of leading universities The annual volume of pathological and clinical resources in the general hospitals amounts to more than 45,000 inpatient admissions and over 605,000 outpatient visits

Information concerning employment in the Public Health Service may be obtained from the Surgeon General, United States Public Health Service (P), Washington 25, D C

Visiting Scientist Program

The visiting scientist program is a flexible arrangement for inviting outstanding American and foreign scientists to utilize the laboratory and clinical research resources of the National Institutes of Health Two classes of appointment are available, visiting scientist and 'research associate in the visiting scientist program" Participants must have a doctoral degree or the equivalent background, at least six years of postgraduate experience, and exceptional ability in a specific research problem The salary range is from $5,400 to $12,600 a year The purpose of the program is to increase the utility of the National Institutes of Health as a national resource and to strengthen interrelations with the broader scientific community

Conferences and Seminars

To encourage early and adequate exchange of information among investigators, numerous conferences, seminars, and symposiums are supported in connection with the grants and training programs Many of the meetings are initiated and sponsored by the advisory study sections of the Division of Research Grants

In addition, the Institutes and Divisions, separately or as a whole, present lectures, seminars, and clinical conferences Frequently there is active participation by faculty members of universities and medical schools, staffs of other research centers and Public Health Service hospitals, physicians in private practice, and other leaders in the medical sciences

Medical Education for National Defense

The Medical Education for National Defense (MEND) Program is at present active in 71 medical schools in the United States, and 11 additional schools have been selected for affiliation effective Oct 1, 1960 On that date, 82 of the country's 87 medical schools will have joined the MEND program, which began in 1952 as an *experiment in* five schools

The 71 schools now taking part in the program are Albany, Albert Einstein, Arkansas, Baylor, Boston University, Bowman Gray, Buffalo, California (San Francisco), California (Los Angeles), University of Chicago, Cincinnati, Colorado, Columbia, Cornell, Creighton, Duke, Emory, Georgetown, George Washington, Hahnemann, Howard, Illinois, Indiana, Iowa Jefferson, Kansas, Louisiana State, Louisville, Marquette, Maryland, Mayo, College of Medical Evangelists, Meharry, Miami, Minnesota, Michigan, Mississippi, Missouri, Nebraska, State University of New York (Syracuse), New York Medical College, New York University, North Carolina, Northwestern, Ohio State, Oklahoma, Pennsylvania, Pittsburgh, Puerto Rico, Rochester, South Dakota, Southern California, Stritch, Temple, Tennessee, Texas (Galveston), Texas (Southwestern), Tufts, Tulane, Utah, Vanderbilt, Vermont, Medical College of Virginia, University of Virginia, Washington University (St Louis), University of Washington (Seattle), Wayne, Western Reserve, West Virginia, Wisconsin, and Woman's

The schools which have been selected for affiliation effective Oct 1, 1960, are Alabama, Dartmouth, Florida, Georgia, Harvard, Johns Hopkins, Kentucky, St Louis, South Carolina, SUNY (New York City), and Seton Hall

MEND operates under the joint direction of the Federal MEND Council and the Committee on MEND of the Association of American Medical Colleges The Council represents the federal agencies which furnish financial support for the program, namely the Departments of the Army, Navy, and Air Force, the Office of Civil and Defense Mobilization, and the Public Health Service

The purpose of the program is to encourage the teaching of military and disaster medicine by regular faculty members of the nation's medical schools The emphasis throughout is on medical, rather than military, aspects Nothing is mandatory, each faculty is free to reject any part of the program which it may deem inconsistent with the local principles of medical education Through successful operation of the MEND program, the problem of national preparedness in medical education can be solved by interested faculty members on a local basis and under local control rather than through such methods as the establishment of a federal medical school or through direct federal intervention in curricular content

Every year MEND sponsors a series of symposia, which are conducted by federal medical personnel for the benefit of faculty members of medical schools During 1959 to 1960, four symposia were held Their topics, the agencies conducting them, and their locations were "Preventive Medicine and Health Mobilization," held at Public Health Service installations in Cincinnati, Atlanta, Charlottesville, Virginia, and Washington, D C, "Blood, Fluids, and Trauma," Walter Reed Army Institute of Research, Washington, D C, "Lectures in Aerospace Medicine," School of Aviation Medicine, Brooks Air Force Base, San Antonio, Texas, and "Radiation, Clinical Research, and Rehabilitation," U S Naval Hospital, Oakland, California An average of 100 medical school faculty members attended each of the symposia Every year, MEND also conducts an Orientation Tour for deans and MEND coordinators of schools newly affiliated with the program The tour is designed to introduce them to current medical research, practices, and facilities in the federal services

Activities at the 71 schools have included special lectures, conferences, and demonstrations in such subjects as surgery of trauma, wound ballistics, war wounds, radiobiology, defense measures against chemical and biological warfare, aviation medicine, management of mass casualties, civil defense responsibilities of the medical profession, infectious disease problems in disaster conditions, and others Several large-scale exercises have been conducted by the schools in cooperation with local civil defense authorities, using the 200-bed emergency hospitals provided by OCDM In the spring of 1960, three medical schools in Texas sent large contingents of students, accompanied by faculty members, to observe massive exercises in the management of mass casualties staged by the Army at Fort Sam Houston in San Antonio

The office of the national coordinator of MEND is located in the Bureau of Medicine and Surgery, Department of the Navy, Potomac Annex, Washington 25, D C

Selective Service System

The following information, current as of July 1, 1960, has been submitted by the Selective Service System National Headquarters

The responsibility for primary classification of registrants rests with Selective Service local boards If a person or his employer (college, medical school, or hospital) has requested his deferment and he has been classified as available for military service, the person or his employer may, within 10 days of the mailing of the notice of classification, file an appeal The appeal will be reviewed ordinarily by the appeal board having jurisdiction where the registrant's local board is located, but it may be transferred for review to the appeal board having jurisdiction in the area where the registrant is working or attending college if this is requested in writing when the appeal is made If the state appeal board should sustain the classification, the registrant or his employer may, if there is a dissenting vote in the appeal board, file a written request with the local board to have the decision appealed to the President If there is no dissenting vote, the state or national director of Selective Service may appeal the case to the President

The Undergraduate College Student Certificate (SSS Form 109) will be used for undergraduate students entering institutions of higher learning The Graduate or Healing Arts College Student Certificate (SSS Form 103) will be used for post-graduate students entering medical school in furnishing the Selective Service local boards with information regarding registrants who are enrolled as students in these institutions These forms should be submitted to the local boards by the educational institution on request of the registrant However the mere filing of such a form does not constitute a request for occupational deferment since, in order to establish the right of appeal as an interested party, a written request from the college or employer for occupational deferment must accompany the form The registrant has the right of appeal if exercised in the prescribed 10 days He may make his appeal informally in writing

Eligibility for Consideration for Deferment —The law empowers the President to provide for the deferment of any person whose deferment is equitable and in the national interest Furthermore, it is the sense of Congress that provision should be made for the annual deferment from training and service of premedical, predental, and allied preprofessional students in numbers equal to those at present (1950) in attendance at colleges and universities as outlined in the general student deferment program

Sections 1622 15 and 1622 25 of the Selective Service Regulations specify the conditions under which students pursuing programs of higher education may be considered for deferment Within these specified requirements, students of the healing arts are considered for deferment in the same manner as students pursuing other undergraduate or graduate courses at colleges universities, and similar schools

Any student not previously deferred who is pursuing a full-time course of study is entitled to a single period of statutory deferment, Class 1-S until the end of the academic year Such deferment does not preclude the possibility of later deferment in Class 2-S Students whose activity in study, research, medical, or other endeavors is found necessary to maintenance of the national health, safety, or interest may be deferred in Class 2-S until completion of their college training, provided they maintain satisfactory scholastic records A student who is deferred for study extends his liability for military training and service up to his 35th birthday instead of his 26th, as prescribed for registrants who have never enjoyed a deferment

In selecting a student for deferment in Class 2-S, the Selective Service local boards may, at their discretion, be guided either by the score made by the student on the Selective Service College Qualification Test or by his record of academic performance The college qualification test is given for the Selective Service System by the Science Research Associates, Inc, of Chicago At present, in order to be eligible for deferment on the basis of this test, an undergraduate student must make a score of 70 or more SSS Form 108 has been prescribed for furnishing to the local board the score made on this test This score is confidential and may be divulged by the local board only to the registrant or to one holding his written consent

To qualify for deferment on the basis of academic performance, the nonprofessional student must have maintained the following standing among the male members of his class freshman year, upper one-half, sophomore year, upper two-thirds, and junior year, upper three-fourths A student accepted for admission to medical school after July 1, 1951, for the class next commencing may be deferred, provided that, during his last full-time year at college or university, he was ranked among the upper one-half of the male members of his class or had a score of 70 or more on the Selective Service College Qualification Test

A student accepted for admission by a graduate school after July 1, 1951, as a full-time student for the class next commencing may be deferred provided that, in his last full-time academic year in a college or university, he achieved a scholarship standing among the upper one-fourth of the male members of his class or scored 80 or more on the qualification test and provided that the graduate school certifies that he is meeting the degree requirements Decisions concerning deferment of American students enrolled in foreign universities, including medical students, are the responsibility of the local boards The local board may accept or reject any claims or evidence presented for deferment

Status of Interns and Residents —The Selective Service System has always recommended the deferment of graduates of medicine to complete one year of internship training Selective Service has stated that men, to be given favorable consideration for deferment to complete a residency or more than one year of internship, should be absolutely essential to the operation or maintenance of the hospitals where they are employed or that they be among those selected by the Assistant Secretary of Defense Health and Medical, to participate in the Armed Forces Reserve Medical Officer Commissioning and Residency Consideration Program or by the Surgeon General of the United States Public Health Service and recommended for specialty training necessary in the staffing of hospitals of the Armed Forces or the United States Public Health Service The Selective Service System is of the opinion that there is a sufficient number of young physicians who have satisfied their military liability or who are physically disqualified for military service to satisfy the requirements of the hospitals for residents and to provide for specialty training for civilian needs.

The Director of the Selective Service System has agreed to recommend to the Selective Service local boards the deferment of the men selected by the Department of Defense and by the United States Public Health Service, the latter not to exceed 300 as an over-all total for the Public Health Service. It is expected that these programs may be continued from year to year dependent upon the needs.

All young physicians participating in these programs must be commissioned in a Reserve component of the Armed Forces or the Public Health Service and agree to serve two years active duty following the completion of such training. The request for deferment is to pass from the individual to the Department of Defense, attention of the Assistant Secretary of Defense, Health and Medical, or the Surgeon General of the United States Public Health Service. Then, if recommended, it will be forwarded through national headquarters of the Selective Service System to the respective local boards of that system.

Those graduates of medicine who accept a commission in the medical corps reserve of an armed force will not be used, according to present Selective Service policy, to fill a regular call, therefore, such young men who are accepted in the Armed Forces Reserve Medical Officer Commissioning and Residency Consideration Program and who accept reserve commissions will be classified by their Selective Service local boards in a class indicating that they are members of the reserve forces. Should it become necessary for the Department of Defense to place with Selective Service a special call for doctors of medicine, such men will then be given consideration for deferment from active duty for such period of time necessary to complete their training.

A young physician who has established himself in a community where he has been found by his local board essential to the maintenance of an adequate medical service in that community may be deferred by his Selective Service local board or such a physician may be deferred for teaching, research, or Public Health work when these are considered by the local board to be essential in the national interest.

For the academic year 1960 to 1961, the Public Health Service has arranged certain research grants for students who have completed two years in medicine. These grants will be for one year, and the deferment of these special men will be requested by the individual registrant and recommended by the surgeon general, United States Public Health Service.

Status of Faculty Members.—No policy has been announced by the Selective Service System on the granting of deferment to faculty members, except that teachers of medicine have been mentioned in a Selective Service Operations Bulletin as being in a critical occupation to which local boards should give special consideration. It has been recommended that as a general policy, essential members of the medical, dental, and veterinary faculties be held in their teaching positions until such time as replacements are found. This recommendation applies especially to persons in the basic science departments. This policy is not a blanket recommendation for deferment from military service for all teachers. Part-time teachers, who devote only a small portion of their time to teaching, will be expected to enter the military services. The President is also directed to establish a national advisory committee to advise the Selective Service System and to assist state and local advisory boards in selecting the needed medical, dental, and allied personnel.

Expiration of the "Doctor-Draft" Law.—The August, 1957, issue (vol. 7, no. 8) of Selective Service carried a statement regarding the expiration of the "Doctor-Draft" law and the new legislative provisions for "Specialists' Service." Because of its importance from the standpoint of medical education as well as its implication in medical practice, this statement is presented in full in the following paragraphs.

"Doctor-Draft" Law Expires, New Legislation Provides for Specialists' Service.—Amendments to the Universal Military Training and Service Act, as amended, adopted in June, 1957, replace the former "Doctor-Draft" law and provide for meeting the requirements of the armed forces for medical, dental, and allied specialists until June 1, 1959. Under the new amendments only those specialists who are otherwise liable as regular registrants are subject to induction under the Selective Service law.

The old "Doctor-Draft" law under which medical, dental, and allied specialists had been liable since 1950 expired July 1, 1957. It had placed liability for service on older doctors, dentists, and allied specialists, at one time up to the age of 51.

One of the principal effects of the new amendments to the basic Selective Service Law is to limit liability of doctors, dentists, and allied specialists to age 35 for those deferred on or after June 19, 1951, and to age 26 for others. Public Law 85-62 which amends the basic Selective Service Law with respect to these specialists, was signed by the President on June 27, 1957. By placing medical, dental, and allied specialists under the same provisions of law and regulations as other registrants with respect to the upper limit of the age of liability, the 1957 amendments relieve from liability under the Universal Military Training and Service Act, as amended, any such specialist over the age of 32 on the date the amendments became effective—July 1, 1957. This is true because in order to have acquired extended liability under the June 19, 1951 amend ments, a registrant not only must have been deferred on or after that date but also must not have attained the 26th anniversary of his birth by that date Any man who was 26 on June 19, 1951, would on July 1, 1957, have been 32 years old

The amendments in addition provide that

1 No person in the medical, dental, and allied specialist categories shall be inducted if he applies for an appointment as a reserve officer and is or has been rejected for such an appointment on the sole ground of physical disqualification

2 The President may order to active duty for not more than 24 consecutive months any member of a reserve component who is such a specialist, who is under 35, and who has not performed at least one year of active duty in the armed forces

3 Any such person called or ordered to active duty from a reserve component of the armed forces and who serves on active duty as a specialist for 12 months or more, shall on release from active duty or within 6 months be given an opportunity to resign the commission unless he is otherwise obligated to serve in active training and service in the armed forces or in training in a reserve component by law or contract

4 Any physician or dentist qualified for a reserve commission shall, so long as need for his services exists, be given an opportunity to volunteer for active duty of not less than 24 months

5 The President may prescribe rules and regulations for the selection or induction of persons by age group or groups and for the selection and induction of persons qualified in needed medical, dental, or allied specialist categories pursuant to requisitions submitted by the Secretary of Defense

6 Qualified specialist aliens liable for induction shall not be held ineligible for appointment as commissioned officers solely on the grounds that such alien specialists are not citizens or have not declared their intention of becoming citizens

7 Any qualified person who is liable for induction or who is ordered to active duty as a member of a reserve component as a physician, or a dentist, or in an allied specialist category, shall be appointed, reappointed, or promoted to such grade or rank as may be commensurate with his professional education, experience, or ability provided that any person in a needed medical, dental, or allied specialist category who fails to qualify for, or who does not accept a commission, or whose commission has been terminated, may be used in his professional capacity in an enlisted grade

8 Periods of active duty performed by such specialists in student programs prior to receipt of appropriate professional degree or in intern training shall not be counted toward establishing the qualification of such specialists for classification as a veteran exempt from liability for training and service

9 It is the sense of Congress that the President provide for deferment of optometry students and premedical, preosteopathic, preveterinary, preoptometry, and predental students in numbers at least equal to the numbers of such male students now studying in colleges and universities

10 Public Law 62, 85th Congress, amending the Universal Military Training and Service Act, as amended, to provide service liability for persons in medical, dental and allied specialist categories, expired July 1, 1959, and was reenacted by Public Law 86 4, 86th Congress, and expires July 1, 1963

With the expiration of the requirement for special registration of medical, dental, and allied specialists, such specialists under the amendments of June 27, 1957, should notify their local boards within 10 days of the attainment of degrees in these fields

Armed Services

The following information summarizing the Army, Navy, and Air Force procurement programs has been submitted by the office of the Assistant Secretary of Defense (Health and Medical), current to June 26, 1958 It has been prepared so as to present a general portrayal of current procurement programs in the medical branches of the armed services insofar as they concern undergraduate and graduate medical edition

Army

Information and application forms for the following programs may be obtained by writing to The Surgeon General, Department of the Army, Washington 25, D C, Attention Chief, Personnel and Training Division

Medical students may apply for commissions in the grade of second lieutenant, Medical Service Corps, Army Reserve, while attending medical school Students participating in this program will be obligated to accept superseding appointments in the grade of first lieutenant, Medical Corps, Army Reserve, on graduation and, in accordance with the needs of the active Army, may be required to serve on active duty for a period of two years on completion of internship Persons appointed under this program are assigned to Ready Reserve Units in appropriate medical corps vacancies in TOE and TD troop program units, USAR Schools, and USAR Control Groups (Annual Training)

Every effort will be made to place officers commissioned under this program on active duty on a date desired by them, however, no assurance can be given that they will be ordered to active duty at a particular time, since such action is contingent on programmed requirements of the active Army

Participation in this program will not in itself increase the active service liability or obligation of the participant However, participants will be required to certify to their understanding that appointment prior to attaining age 26 incurs an obligation for active participation in the Reserve training unless excused under regulations prescribed by the Secretary of the Army.

Clinical Clerkship Training Program.—Participants in the Clinical Clerkship Training Program will be medical students at the sophomore to junior or junior to senior level, or better, who now hold appointments in the Medical Corps, Army Reserve, as lieutenants, or will be commissioned in sufficient time to participate in the program. A limited number may also participate in the program as "student employees" under Civil Service. Students in Army Reserve status who are selected for this clinical clerkship must volunteer to perform not more than 60 days of active duty for training, including travel. Students who are assigned to a USAR Control Group (Annual Training) and are selected for the clerkship will fulfill their annual requirement for active Reserve participation by performing the above period of active duty for training. The students who are assigned to a TOE or TD Reserve Unit, or a USAR School will perform this training "in lieu of" the annual unit training (summer camp) requirement with their unit.

The program will consist of approximately 8 weeks of instruction at Army teaching hospitals, which will be devoted to military medicine and other military instruction, and the remaining time will be divided into two equal periods, one embracing internal medicine and its subspecialties, the other surgery and its subspecialties. A preventive medicine program will also be available and will include one week of general orientation in military organizations, its functions and procedures, followed by detailed observation and assistance in a comprehensive preventive medicine program. Research clerkships are also available in a limited number for selected individuals at several medical facilities.

The program is from 45 to 60 days' duration and may commence at any time convenient to the student.

A student selected for a clerkship between his sophomore to junior year is not eligible to apply for the clerkship between his junior to senior year.

Senior Medical Student Program.—Selected senior medical students will be commissioned as second lieutenant, Medical Service Corps, Army Reserve, and will be permitted to continue their studies in their respective schools as officers on active duty with full pay and allowances until they complete their academic requirements for the degree of doctor of medicine, or until completion of the academic year in which enrolled at the time of entry on active duty, whichever occurs earlier. On completion of their medical education, selected students will be required to accept appointments in the grade of first lieutenant, Medical Corps, Army Reserve, they must agree to participate in the National Intern Matching Program, Incorporated, and serve on active duty for three years immediately following their civilian or military internship. This includes time obligated under the Universal Military Training and Service Act, if applicable. Participants who are not matched for an Army internship will be released from active duty for one year to allow them to complete a civilian internship, and they will then be recalled to active duty for three years at the end of the 12-month period.

Military Intern Program.—Selected graduates of approved medical schools will be commissioned as first lieutenants, Medical Corps, Army Reserve, and will be ordered to active duty for the purpose of completing a 12-month internship in a military hospital. Individuals participating in the program will not incur obligatory service, however, those individuals who will be liable for military service under the provision of any law will be required to serve that obligation immediately upon completion of their internships. Military interns will be encouraged to apply for Regular Army and residency training.

Applicants must agree to participate in the official cooperative plan of internship appointments for first-year internships as conducted by the National Intern Matching Program, Incorporated.

Military Resident Program.—The Military Resident Training Program is established for the purpose of providing the number of specialists required to meet the needs of the Army for career Medical Corps officers. Training in civilian hospitals is authorized only when the specialty needs of the Army cannot be met by training in Army teaching hospitals.

Officers of the Regular Army Medical Corps and individuals who meet the appointment criteria for the Regular Army are eligible to compete for residency training. Although appointment in the Regular Army is not a requirement for appointment as a resident, the purpose of the program is to provide the Army with sufficient career personnel having the required specialty training. Accordingly, applicants will be considered on the following priority basis: (1) Regular Army Medical Corps officers, (2) Reserve Medical Corps officers on active duty, including interns who are concurrently applying for Regular Army appointment, (3) civilian physicians, including interns, who apply for Regular Army appointment, and (4) all other applicants.

Inasmuch as the number of applications received for participation in the Army residency program far exceeds the number of appointments available, consideration should be given to seeking a Regular

Army commission in order to establish a priority for consideration for the residency program Appointment for the program ordinarily will not be made more than one year in advance, and applications for Regular Army in connection with residency training will not be considered for appointment in a grade higher than captain Individuals selected for training who have not completed the appropriate Army Medical Service orientation course, or an equivalent period of active duty as a medical officer, as determined by the surgeon general in each case, will be required to undergo such training prior to entering residencies Selections will be made in January of each year Appointments to fill remaining vacancies will be made from applications as received

Individuals placed in residencies in Army hospitals will be required to serve one year on a duty status for each year of training received

Navy

The Ensign 1915 USNR Program —After passage of the Selective Service Act of 1940, many medical students who were obligated for military service by the Act indicated their desire to affiliate with the Naval Reserve in order to assure that their period of active duty would be with the Navy s Medical Department To make this possible and to provide deferment from active duty until graduation, the Ensign, Probationary (Medical) Program was established before the onset of World War II The first appointments late in 1941 were limited to third-year and fourth-year medical students attending class A (approved) medical schools Within a few months, however, the program was expanded to include first-year and second-year medical students and it has since come to be known as the Ensign 1915 Program

The qualifications for appointment as Ensign, 1915, are as follows

A Sex Men and Women

B Age (1) Candidates with no prior military service should be at least 19 and of such age that upon expected date of graduation, they will be under 33 The maximum age limit with prior active military service may be adjusted on a month-to-month basis, depending upon the number of months of active military service performed, but in no case to exceed 36 months Applications cannot be accepted from any persons who will have passed his or her 36th birthday when he or she becomes eligible for superseding appointment in the Medical Corps, U S Naval Reserve following graduation from medical school

C Educational (1) Should be within 120 days of completion of all academic work required for enrollment in medical school (2) Should be in attendance or have been accepted for and be within six months or less of the date of the next entering class at one of the American or certain of the Canadian medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Association, including approved schools of the basic medical sciences in the United States and Canada Applications cannot be accepted from students who will attend a medical school in a foreign country other than Canada (3) Should NOT have commenced the final year of medical school

D Professional (1) Applicants are required to establish professional fitness and aptitude for the Naval Service through interviews and a review of college and employment records

E Physical Standards (1) Should be found physically qualified for appointment to commissioned status in accordance with established regulations

The primary objectives of this program are to provide (1) an opportunity for qualified medical students to affiliate with the Naval Reserve as commissioned officers while still in medical school, (2) assurance that these officers will be able to complete their medical studies and internship prior to fulfilling their obligation for active military duty, (3) assurance that, when they do enter the service, it will be within the Navy's Medical Department, and (4) a primary source of qualified candidates for the Naval Intern Program and for the Medical Corps of the Navy and Naval Reserve

As an added incentive for membership in the Ensign 1915 Program, there has been established a 30-to-60 day active duty research clerkship training program at naval reserve activities throughout the United States This program provides orientation and indoctrination into medical research as well as on-the-job training for the undergraduate medical student during his vacation from medical school Full pay and allowances are authorized for these selected officers while so serving on active duty Medical students who are commissioned as Ensign, 1915 USNR, and who have successfully completed the first year of medical school are eligible to participate in this program Research clerkships offer a detailed review of the specific research program being conducted at the training activity A part of the training is spent in each research department, and the trainee serves as an assistant in actual laboratory research on a specific project under way at that time

Also established are clinical clerkships at Naval teaching hospitals throughout the United States Beginning July 1 of each year, this program offers quotas for selected medical students who have completed the second year of medical school, 30 to 60 days of active duty for training during vacation from medical school Clinical clerkships are planned to provide indoctrination and orientation into naval medicine, rotation through the major professional services of a naval teaching hospital, and performance of on-the-job training duties commensurate with the individual's professional attainments

Normally each year during the summer months a limited number of mature medical students holding commission as Ensign, 1915, are authorized to participate in NROTC-Midshipmen Cruises Selections for this important training are made from students who have completed at least their second year of medical school with priority being given those who have completed their third year Trainees receive an excellent indoctrination and orientation into the practices of naval medicine aboard ship under the supervision of experienced medical officers of the Regular Navy and Naval Reserve

To assist the medical student financially, and to attract future doctors of medicine toward a career in the Navy Medical Corps, the Senior Medical Student Program was authorized by the Secretary of the Navy To be eligible for participation, the individual student must be an Ensign, 1915 USNR, or agree to accept such an appointment if selected Further, he must have completed his third year of medical school and be eligible for enrollment in the ensuing year During attendance in medical school, these officers serve on active duty, receiving the full pay and allowances of their rank In return for participation in this program, the individual serves one year plus 24 months, which, if required, satisfies the individuals Selective Service obligation

Here are some important facts concerning the Senior Medical Student Program

1 This program is open to qualified students enrolled at medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Association Students who have completed their second year of medical school may make application for this training at any U S Navy Recruiting Station Active duty commences and continues while in attendance during their senior academic year To be eligible for participation, he must be an Ensign, 1915 U S Naval Reserve, or agree to accept such an appointment if selected A board convened in the Bureau of Medicine and Surgery selects the candidates for participation in this program

2 Physical standards of this program are the same as those established for Regular Navy staff corps officers

3 Active duty orders are mailed to the student via his recruiting station or District Commandant Active duty commences after receipt of such orders and upon the day certified by the dean as the day senior studies begin

4 The student agrees, in writing, to accept a Regular Navy commission, and if a Regular Navy commission is not tendered, to accept an appointment in the Naval Reserve

5 In accepting an appointment in the Regular Navy or Naval Reserve, as a result of having active service in the Senior Medical Student Program as an Ensign, 1915, he is obligated to serve on active duty and to retain the commission for a period of three years This active service will commence upon completion of not more than 12 months of a civilian or Naval Internship Providing that the student has 24 months obligated military service to perform, this active duty affords a splendid opportunity to discharge the military obligation and serve an additional year in return for the benefits received in the Senior Medical Student Program With no obligated military service to perform, upon enrollment in the Senior Medical Student Program, the student obligates himself to serve for the same period of three years

6 As a medical student, he receives the full pay allowances of an Ensign, 1915, while so enrolled on active duty Pay and allowances are based on longevity as follows (*a*) Less than two years and no dependents, he receives $338 58 per month, with dependents (a member of his family or household dependent upon him for financial support) he receives $355 68 per month (*b*) Over two but less than three years and no dependents, he receives $366 28 per month, with dependents, he receives $384 38 per month (*c*) Over three and no dependents, he receives $429 28 per month, with dependents he receives $447 38 per month

7 In addition to the pay and allowances, the student is credited with 2½ days of annual leave for each 30 days of active duty served

8 The wearing of the Naval uniform is permitted only when authorized by appropriate naval authority

9 Timing is very important An average of four months is required to completely process each application February 1 each year is the absolute deadline that completed applications must be forwarded to the Bureau of Naval Personnel, Navy Department, Washington, D C This is necessary so that sufficient time is given to the board in the Bureau of Medicine and Surgery to pass on the professional qualifications and the board in the Bureau of Naval Personnel to pass on the over-all qualifications of each applicant Those selected are required to meet the moral, mental, and physical standards of Navy acceptance All applicants will be notified by individual letter of their acceptance or rejection not later than the first week in May

Naval Internships—Naval internships are 12 months in duration, are rotating in type, and conform in all respects with the requirements of the

Council on Medical Education and Hospitals of the American Medical Association These compare most favorably with the best civilian internships, and each year the number of applicants considerably exceeds the number of available naval internships Internships are offered at the U S Naval Hospitals located at Camp Pendleton, Calif Oakland, Calif, San Diego, Calif, Jacksonville, Fla Pensacola Fla, Great Lakes Ill Bethesda Md, Chelsea, Mass, St Albans, N Y Philadelphia Newport, R I, Charleston, S C, Portsmouth Va and Bremerton, Wash

All naval interns are selected and matched to the Navy by the National Intern Matching Program, Incorporated It is not necessary for the medical student to be a participant in the Ensign 1915 USNR Program in order to apply and be accepted for a naval internship On the other hand if the Ensign 1915 USNR candidate does not desire a naval internship he should list only the civilian hospitals in the order of his preference The Ensign 1915 candidate who is matched to a civilian internship will be placed on inactive duty during the period of his internship, following completion of which he will be called to active duty in compliance with his previous service agreement

The basic requirements for a naval internship include the following (1) be a graduate or potential graduate of a medical school approved by the American Medical Association or have successfully passed the ECFMG examination, (2) be a citizen of the United States, (3) be registered with and his name appear in the *Official Directory of Students* published by the National Intern Matching Program, Inc, and (4) meet the prescribed physical standards for a commission in the United States Naval Reserve

In order to become eligible for consideration for a naval internship, candidates must first make application for a commission in the Naval Medical Corps This can be accomplished by visiting or writing to the nearest Office of Naval Officer Procurement or the nearest U S Naval Hospital in the continental United States In applying for a naval internship it is recommended that five (5) naval hospitals be listed in the order of preference Generally assignments are made from among the first three listed The candidate applies, as far as the matching is concerned, directly to the Navy and not to the specific hospital If matched to the Navy, every effort is made to place the candidate in his first choice In the matching program the student is matched to the service and not to a particular hospital within it

Applications for commission in the Naval Medical Corps for intern training are accepted between September 1 and December 1 each year That portion of the application pertaining to internship is accepted between October 1 and December 1 Early submission of applications is strongly recommended

Any additional information may be obtained from the Chief, Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D C

Naval Residency Training Programs—Eight U S Naval hospitals are now approved for residency training in the various clinical specialties of medicine and surgery by the Council on Medical Education and Hospitals of the American Medical Association and by the respective American Specialty Boards These naval hospitals are located at Chelsea, Mass, St Albans, N Y, Philadelphia, Pa, Bethesda, Md, Portsmouth, Va, Great Lakes, Ill Oakland, Calif, and San Diego, Calif Residency training for medical officers is also actively sponsored by the U S Navy in selected outstanding civilian hospitals, schools, and medical centers of the United States in those few specialties wherein the Navy does not operate formalized training programs or where they are not sufficient to meet Navy needs U S Naval Hospital residency training activities embrace the specialties of anesthesiology, cardiovascular disease, dermatology, internal medicine, neurology, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology pathology, pediatrics, plastic surgery, psychiatry, pulmonary disease, radiology, surgery, thoracic surgery, and urology Formally approved training in civilian institutions is conducted in allergy, gastroenterology, hematology, neurology, neurological surgery, plastic surgery, children's orthopedic surgery, thoracic surgery, radiobiology, aviation medicine, occupational medicine and public health

Medical officers eligible for assignment to duty as a resident are Regular Navy officers and those Reserve medical officers who are willing to accept and can qualify for a commission in the Regular Navy Requests for residency training duty should be forwarded to the Chief of the Bureau of Medicine and Surgery, Navy Department, Washington 25, D C All such requests are acted upon by the Bureau Advisory Board on professional training matters This board makes recommendations in accordance with the merits of each case, taking into consideration the professional experience, background, and aptitude of the candidate and the needs of the service in the particular specialty in which training is desired One year of obligated service is required for each year of training received in a Naval hospital Two years of obligated service are required for the first year of training received in civilian institutions and one year of obligated service for each successive year so spent

It is the policy of the Bureau of Medicine and Surgery to continue a resident in training until formal requirements, leading to eligibility to undergo examination by an American Specialty Board have been met This procedure will be strictly adhered to in every case where the needs of the service permit, barring national emergencies, provided that such an arrangement remains mutually agreeable and satisfactory aptitude and progress as a resident are demonstrated The highest priority in the assignment of naval medical officers to residency training is given those who have completed or are about to complete a normal tour of active duty with an operational unit of the U S Navy at sea or on foreign shore stations

Other Graduate Training for Naval Medical Officers, Including the Military Medical Specialties

Aviation Medicine—The School of Aviation Medicine at Pensacola, Fla , convenes three classes annually of approximately 40 students, for didactic instruction in aviation medicine and actual instruction in flight and ground school Each class is of about six months duration On completion of this course of instruction they are designated naval flight surgeons and assigned to a two-year period of operational duty Additionally, the School of Aviation Medicine is approved for residency training in aviation medicine This training may be requested after completion of the two-year operational duty assignment and consists of one year of public health at a civilian institution and two years of residency training in aviation medicine at the school in Pensacola or any of the approved aviation research laboratories They are then considered board eligible for certification in aviation medicine after another two-year operational tour Further opportunities are available in several large naval laboratories for work in research related to aviation medicine The laboratories are located at Johnsville, Pa , Philadelphia, the School of Aviation Medicine, Pensacola, Fla , and the Naval Medical Research Institute, National Naval Medical Center, Bethesda Md A medical officer interested in the aeronautical aspects would do well to consider this advanced training

Submarine Medicine—This military medical specialty supports all phases of underwater operations in the Navy Training in this specialty is particularly applicable to those having an interest in internal medicine, radiology, anesthesiology, occupational medicine or research The basic 30 week course of training includes lectures, demonstrations, laboratory work, practical experience and cruises in submarines, rescue vessels and tenders as available The course is convened each September at the U S Naval School Deep Sea Divers, Naval Weapons Plant, Washington, D C The first 8 weeks of instruction in underwater physiology is taught here The remainder of the course is given at the Submarine School and Medical Research Laboratory at the Submarine Base, New London, Connecticut

On completion of the first 30 weeks of instruction, two alternatives are available to the student He may terminate his instruction or continue for an additional 10 weeks of training in radiobiology

During the course in underwater physiology the student learns about the physiological problems involved in diving and underwater swimming He also learns about diving by completing deep sea diving exercises The course also covers the recognition and treatment of pathological conditions resulting from exposure to high atmospheric pressures

Those students who terminate after the first 30 weeks of instruction will be assigned duties with conventional submarine squadrons or operational units employing divers and underwater swimmers

The course in radiobiology is taught at the Nuclear-Power Division of the Submarine School The subject matter embraces the essentials of nuclear physics, nuclear engineering, health physics and the biological effects of ionizing radiation Medical Officers who complete this course will be assigned to duty with the Nuclear Power Submarine Program

Career medical officers who elect the 30 week course will be provided with an opportunity to complete the course in radiobiology at a later date

On completion of a tour of duty with an operational unit the medical officer may apply for postgraduate training in various fields He may prepare for certification in preventive medicine by attending one of the public health schools and subsequent field duty ashore and afloat He may prepare himself for a career in research by a postgraduate year at the University of Pennsylvania College of Medicine followed by duty at naval laboratories and with operational units Clinical medical specialty training in all fields is available and having served with an operational units adds weight to one's application

Research Program—The Navy offers Medical Officer billets for military medical research careers These opportunities embrace basic and applied medical research in the fields of aviation medicine, submarine and shipboard medicine, general medicine and surgery, dental medicine, amphibious and field medicine, nuclear medicine, environmental and survival medicine, the medical defensive aspects of atomic, chemical and biological warfare, and the new field of bioastronautics Clinical research is carried out in various Naval hospitals, tropical and exotic diseases are studied in two Navy Medical Research Units located in the Near and Far East The medical officer billets for military medical research careers are distributed in strategic loca tions throughout the world among 15 major inservice laboratories, 3 Tri-Service activities, and 10 facilities located at commands whose primary purpose is not that of research Assignments are also made to laboratories of the other military services and government agencies Every effort is made to provide a continuous career in research for those officers with special aptitudes and qualifications

Amphibious and Marine Corps Field Medicine

Recognized as an important military operational medical specialty, this training is conducted at Camp Lejeune, N C, and Camp Pendleton, Calif This specialty offers valuable training in the various facets of field medicine in order that rapid and efficient medical care can be carried out in the field This includes training in combat first aid, life saving surgery, sorting (triage) management, control and evacuation of mass casualties, and preventive medicine and field sanitation

At the Senior and Junior Schools, Marine Corps Schools, Quantico, Va, the following are included in the training of Medical Department officers (1) Marine Corps organization, (2) Marine Corps tactics and techniques, and (3) medical logistic support for large scale medical planning in support of operations in limited and general war

Research and development of field medical equipment, and field sanitation methodology and practices are carried out at the Naval Medical Field Research Laboratory at Camp Lejeune, N C

Nuclear Medicine —Graduate courses for medical officers are conducted at several U S Naval Hospitals, in affiliation with civilian institutions Additional graduate courses in radiobiology are sponsored by the Navy for medical officers at the University of Rochester, Rochester, N Y, to meet present and future needs of the Navy for personnel trained in the fields of nuclear propulsion, radiological safety and special weapons effects Formal long courses for radiology and other residents are conducted in the clinical use of radioisotopes at the U S Naval Medical School, National Naval Medical Center, Bethesda, Md This latter course is approved by the Atomic Energy Commission and is designed to fulfill the needs of those who wish to appear for future examination for certification by the American Board of Radiology, as well as those residents in other specialties who may need to acquire a better understanding of the clinical utilization of radioisotopes in diagnostic and therapeutic procedures

Operation "Deep Freeze"

The Surgeon General of the Navy has announced that regular and Reserve Medical Corps officer volunteers will be needed each year to man the important Antarctic South Pole, Byrd, Hallet, and McMurdo Sound Bases for Operation "Deep Freeze" The volunteers selected will be trained in phases of medical practice particularly applicable to those stations, including traumatic and general surgery, anesthesiology, otolaryngology, emergency dental care, cold weather medicine, hygiene, and sanitation, and polar air, ice, and water safety and survival

Because the Medical Officer at Pole Byrd, and Hallet Base is also the Officer-in-Charge of the station, selectees will receive additional training in Naval Jurisprudence, communications, administration, morale functions, and leadership

Upon completion of training in the fall, the Medical officers will fly from Davisville, R I, to Antarctica via Honolulu, Canton, Fiji, and New Zealand and will spend approximately one year on the ice at a base with from 15 to 20 men

It is considered that this assignment presents an opportunity to an interested and suitable medical officer to round out medical training, to save money, to participate in an interesting research program—biological, medical, and geophysical, and to become acquainted with the world's last frontier

Interested physicians may address letters of request for further information to the Bureau of Medicine and Surgery, Code 31, Department of the Navy, Washington 25, D C

Air Force

The Air Force presently conducts the Senior Medical Student Program, as well as sponsored Internships and Residencies in military and civilian hospitals Applicants must be United States citizens, be morally, physically, and educationally qualified and must not be nor have been conscientious objectors Complete details on any of the following programs may be obtained by writing to the Surgeon General, United States Air Force, Washington 25, D C

The Senior Medical Student Program —The Air Force Senior Medical Student Program is available to Junior Medical Students The application period for this program is November 1 to March 1 of the student's junior year Those selected are commissioned as second lieutenants and are called to active duty about September 15 Selected applicants agree to accept reappointment as first lieutenants on graduation and to apply for a sponsored internship, either military or civilian Those not selected for sponsored intern training are released from active duty for one year to intern under private contract Selected applicants incur a three-year obligation, which must be served immediately upon completion of internship No additional obligated service is incurred through the combination of the student program and either of the intern programs Tuition, books, and other related expenses must be paid for by the student

Air Force Sponsored Military and Civilian Internships—The Air Force Intern Training Program, begun in 1950, is designed as a Regular Officer Procurement Program To be considered, applicants must meet general eligibility requirements stated above, must not be more than 32 years of age, and must be graduates of medical schools acceptable to the Surgeon General Selections are made on the basis of scholastic standing, physical fitness, and military aptitude and inclination

Air Force Military Internships—For the year beginning July 1, 1961, the Air Force will sponsor one hundred and eight (108) interns in military hospitals, selected through the National Intern Matching Program, Inc Interested students must submit their applications to the Surgeon General, United States Air Force, not later than Dec 1, 1960 Selectees are appointed first lieutenants, Reserve of the Air Force (Medical Corps), and agree to serve on active duty for three years including the year of internship This concurrently satisfies the individual's obligation under the Universal Military Training and Service Act In applying for an Air Force Internship, it is recommended that five Air Force hospitals be listed in the order of preference Generally assignments are made from among the first three listed Internships are of one year duration and are of the general rotating type Training is directed by military and civilian physicians and includes a wide range of clinical material, using modern medical, surgical, and radiological facilities It fully satisfies the requirements of the Council on Medical Education and Hospitals of the American Medical Association

Air Force Civilian Internships—For the year beginning July 1, 1961, the Air Force will sponsor approximately 80 interns in approved civilian hospitals The application period for this program commences on July 1, 1960 and closes on April 1, 1961 Applicants for offterm internships should apply approximately six months prior to the starting date of the training Selected applicants serve on active duty as first lieutenants Reserve of the Air Force (Medical Corps), and must agree to serve for a total of four years, including the year of internship This concurrently satisfies the individual's obligation under the Universal Military Training and Service Act

Residency Training Program—This program is designed to provide competent, well-trained career officer specialists for responsible positions in Air Force medical facilties Participation is normally limited to members of the Regular Air Force or Career Reserve with outstanding qualifications who are genuinely motivated for careers in the Air Force Physicians accepted for the program are trained in Air Force, Army, and civilian hospitals (including nonmilitary Government hospitals)

Training is available in the recognized medical specialties according to the needs of the Air Force Competition is keen since many more applications are usually received than may be approved The chances of an applicant for acceptance are naturally better of he desires training in a specialty in demand The Air Force needs specialists in psychiatry, neurology, general practice, otolaryngology, radiology, gastroenterology, and infectious diseases

The USAF Hospital Lackland, Lackland Air Force Base, San Antonio, Texas, a new teaching hospital of the Air Force, offers approved residency training in anesthesiology, general surgery, internal medicine, obstetrics and gynecology, ophthalmology, orthopedic surgery, pathology, pediatrics, radiology, and urology These programs normally commence on July 1

Physicians who enter this program are expected to remain in training until they have completed the minimum formal training requirements of the specialty boards, provided that progress is satisfactory The Air Force Medical Service prefers to select residents from among those highly qualified physicians who have had an opportunity to observe the practice of medicine in the Air Force A period of active duty permits the individual to evaluate the service from a career viewpoint It also affords the Air Force an opportunity to evaluate the performance of the individual in terms of his suitability and adaptability for a career in Air Force medicine

Applications should be submitted in August or September for training to begin the following July and January Such applications must reach Headquarters United States Air Force not later than November 15

The USAF Aviation Medicine Specialty Training Program leading to board certification in Aviation Medicine is a comprehensive program of five years duration Applicants must be graduates of the Primary Course of Aviation Medicine and have had a minimum of 9 months practice as an Aviation Medical Examiner Applicants must be officers of the Regular Air Force or Career Reserve, physically and professionally qualified, and be no more than 34 years of age when the class convenes Applications must arrive at the Aerospace Medical Center, United States Air Force (Air Training Command), Brooks AFB, Texas, not later than January 1 for entrance into program beginning the following September

Further information pertaining to the over all Medical Education Program of the United States Air Force may be obtained from the Chief, Medical Procurement and Education Division, Office of the Surgeon General, USAF, Washington 25, D C

Undergraduate and Graduate Medical Training Programs in the Veterans Administration

The following material reviewing the Undergraduate and Graduate Medical Training Programs in the Veterans Administration has been submitted by the Director, Education Service, Department of Medicine and Surgery of the Veterans Administration

The relationship of the Veterans Administration with the medical schools of the nation was reaffirmed during the past year as a continuing program embracing all levels of undergraduate, graduate, and postgraduate medical education Following a survey by the Veterans Administration reported in 1959,* the Association of American Medical Colleges conducted an independent study of this cooperative effort with Veterans Administration hospitals Their conclusions published in the *Journal of Medical Education* stated that Veterans Administration hospitals comprise an important segment of the facilities which are currently used to carry on medical education in the United States "

Undergraduate Medical Education

During the past year, over 2,700 fourth-year medical students and approximately 3,300 third-year medical students were assigned to Veterans Administration hospitals for clinical clerkships An additional 1,500 first and second-year students were assigned to VA hospitals for other portions of their formal curriculum such as physical diagnosis, and lectures and demonstrations in both clinical and basic sciences

Graduate Training Programs

The extensive VA graduate training program has continued to function with the support of dean's committees representing 73 of the nation's medical schools In December, 1959, there were 600 approved residency programs in 21 medical specialties, 27 residency programs in the three specialties of dentistry, and 34 dental internships The latter were conducted in conjunction with 29 dental schools

On Dec 31, 1959, there were 2,994 medical residents on duty, 281 of which were assigned under the career resident program The career resident appointment carries with it an obligation to serve with the VA full-time for a specified period of time at the completion of residency training A noncareer or regular resident appointment has no requirement of obligated service following the training period Career resident appointments are offered only in the scarce category specialties of anesthesiology, neurology, psychiatry, pathology, physical medicine and rehabilitation, and radiology

During calendar year 1959, approximately 46% of the VA hospitals (79) had an autopsy rate of 72% or above Of these hospitals 45 had an autopsy rate over 80%, 10 of these having a rate of 90% or more

In July, 1959, the Council on Medical Education and Hospitals asked the Veterans Administration to obtain data to illustrate statistically the degree to which VA residency programs were interrelated with medical school residency training The questions posed by the Council were as follows

1 Can the VA show the degree to which the VA and non-VA programs are interrelated statistically? (*a*) What is the number of residents who serve in VA hospitals without compensation and who are really residents of other programs? (*b*) Is there a figure that expresses the degree of integration in terms of the number of men who go on the VA payroll for periods of time less than a year or less than the full period of program approval?
2 To what degree are VA residency programs not fully intramural programs? (*a*) How many VA programs are now conducted on an integrated basis even though they might not yet be listed in an indented fashion in the *Directory*?

The study indicated 91 3% of our residencies are conducted in conjunction with non-VA hospitals 35 3% of VA residencies are identified as integrated programs with university or medical center sponsorship of a group in which the VA is only one of several participating hospitals In another 49 1%, the VA is considered the parent hospital and assigns residents to non-VA institutions for short periods for special experience not available intramurally The remaining programs comprised the affiliate residencies (7%) and the independent residencies (8 6%) In an affiliate program a non-VA hospital is designated the parent hospital and rotates residents to the VA for short periods of time to gain experience not available in the parent institution The independent residencies are for the most part one and two-year programs which are conducted without any non-VA assignments

During the fiscal year ending June 30, 1959, a total of 3,602 residents received a stipend from the VA These residents served in the VA for periods of time varying from a few months to a full year Of these residents 1,750 or 48 6% spent part of the year in a non-VA hospital Further, these statistics revealed that the associated medical schools assisted in the recruitment of 1,516 or 42% of these residents

In addition to the number of residents serving in VA hospitals to whom a stipend was paid, 506 were assigned to the VA on a "without compensation" basis The study showed that 402 of these residents received their stipends from university or university affiliated hospitals, 57 were supported by stipends from other federal services such as the Army or Navy, and 47 were paid by non-university hospitals while assigned to the VA The final questions in the survey were concerned with measuring in some way the contribution of the full-time VA staff physician to the teaching of residents sponsored by the associated medical schools during their training period in non-VA hospitals The report showed that 1,409 full-time physicians are engaged in teaching residents within our VA hospitals Of this number approximately 520 physicians give lectures and demonstrations to residents in non-VA medical school teaching facilities and approximately 360 actually make scheduled rounds in non-VA medical school teaching facilities It is estimated that over 52,000 man-hours annually are contributed by our full-time staff to teaching residents in non-VA medical school facilities It should be emphasized this statistic does not include time spent teaching medical students in the medical schools nor time spent teaching students or residents in our own hospitals The majority of these residents are planning careers in private practice or in academic medicine and do not enter the government service at the conclusion of their training

Foreign Medical School Graduates

During calendar year 1959, 188 residents were graduates of foreign medical schools All of these residents were United States citizens, the only non-citizen residents employed by the Veterans Administration being graduates of U S or Canadian medical schools There were 39 Canadian medical school graduates last year One hundred and thirty-five non-citizen residents served on a "without compensation" basis by assignment from university hospitals This is the only mechanism whereby non-citizen foreign medical school graduates can be appointed in our hospital system The Veterans Administration adopted the requirement of ECFMG certification for all foreign medical school graduates and plans to maintain the July 1, 1960, deadline for certification of all candidates

Clinical Investigator Program

The newest but one of the most important educational efforts of the Veterans Administration has been the Clinical Investigator Program, inaugurated in 1956 The first group of Clinical Investigators completed their assignment in December, 1959 Education for leadership—the program was designed as an opportunity for young physicians who have completed their clinical training and demonstrated their research ability to spend a major portion of their time in research for a period of up to three years This concentrated effort in research broadens and refines their experience so that at the conclusion of this assignment the Clinical Investigator has reached the level of accomplishment of an independent investigator They are then uniquely qualified through their educational experience in both clinical medicine and research to exert effective leadership as they take on major responsibilities in the patient care program on a full-time basis

A careful selection process was established to choose the most outstanding young physicians for this special appointment of Clinical Investigator Candidates are evaluated by the VA Hospital Research and Education Committee as well as by the Deans Committee which represents the affiliated medical schools From this initial group of nominees, the Selection Committee for Veterans Administration Clinical Investigators then selects the most outstanding candidates for appointment

A total of 65 Clinical Investigators has been selected to date, 23 of whom have completed their three-year assignments

Clinical Investigators, residents, and trainees in all of the paramedical fields comprise a significant national resource contributed annually through the Veterans Administration training programs to the health service field

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6 Klinger, E, and Gee, H H Study of Applicants 1958-59, *J Med Educ* 35 120-133 (Feb) 1960

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Educational Programs of Allied Medical Services

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ANNUAL REPORT

Acknowledgement

This represents the first separate report on Educational Programs of Allied Medical Services prepared by the Council on Medical Education and Hospitals Previously, summary information on these programs has been included as a part of the Council's Annual Report on Medical Education in the United States and Canada The present study, however, considers these programs in more detail and lists those accredited training programs that meet or exceed the established minimal standards of training A statement of the minimal "Essentials" for an approved program in each of the areas has been developed by the Council on Medical Education and Hospitals in collaboration with the education committee or advisory board of the national organization concerned in that particular field These standards of education are included as a part of this publication

The Council on Medical Education and Hospitals wishes to express appreciation for the American Medical Association to the organizations involved the directors of the various programs, and other individuals who contributed the information that has made possible the preparation of this report

Medical Technology

Introductory Statement —The field of laboratory medicine has progressed by leaps and bounds during the past several decades and will continue to play a continually greater role in medicine The American Society of Clinical Pathologists, realizing the need for better and more uniformly trained medical technologists, organized the Board of Schools of Medical Technology in 1949 to assist the Council on Medical Education and Hospitals in developing plans to approve, inspect and elevate the standards of training in schools of medical technology

The collegiate requirements for admission to Approved Schools of Medical Technology have remained at two college years or 60 semester hours, with certain science requirements since 1938 Beginning Jan 1, 1962, the minimum requirements for entering an Approved School of Medical Technology will be increased to three years of college, or 90 semester hours Specific course requirements in chemistry and biologic sciences are more specifically defined and moderately increased without defeating the purpose of a broad general education

The Essentials of an Acceptable School of Medical Technology have been revised and strengthened making more uniform the type of training and education in the field of medical technology being offered by Approved Schools of Medical Technology A field survey program designed to encourage better education in the field and to facilitate the exchange of ideas has been in operation for 10 years

(Continued on page 1494)

Approved Schools of Medical Technology

Approved by
Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10

in collaboration with
The Board of Schools of Medical Technology
of the
American Society of Clinical Pathologists

Revised to November 8, 1960
Number of Schools, 734

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
ALABAMA							
Birmingham Baptist Hospitals Birmingham	Alabama College‡‡ Howard College‡ Alabama Polytechnic Institute‡‡	A E Casey, M D	3 yrs	12	8	Quarterly	None[1]
Carraway Methodist Hospital, Birmingham		J A Cunningham, M D, B H Bishop, M D	3 yrs	12	10	Jan July	None[1]
St Vincent Hospital, Birmingham	St Bernard College‡‡	J A Cunningham M D	3 yrs	12	4	Quarterly	None[1]
South Highlands Infirmary Birmingham		W F Scott Jr M D	2 yrs	12	2	July	None[1]
University Hospital Birmingham	University of Alabama‡‡	J F A McManus M D	3 yrs	12	18	Varies	None
Lloyd Noland Hospital Fairfield		H G Davis, Jr M D	2 yrs	12	10	Quarterly	None[1]
Holy Name of Jesus Hospital Gadsden	Jacksonville State College‡‡	J D Bush M D	3 yrs	13½	6	Varies	None[1]
Mobile Infirmary Mobile	Spring Hill College‡ Howard College‡‡ Alabama College‡ Auburn University‡‡	I M Wise M D	2 yrs	[illegible]	8	Quarterly	$25[1]
Providence Hospital Mobile	Spring Hill College‡‡	W E Purvis III, M D	2 yrs	12	4	Varies	$25[1]
St Margaret s Hospital Montgomery	Troy State College‡‡	W B Sorrell M D	2 yrs	12	4	July	None[1]
Druid City Hospital Tuscaloosa		J S P Beck, M D, L S Graham, M D	2 yrs	12	[illegible]	Monthly	None[1]
ARIZONA							
Good Samaritan Hospital Phoenix	Arizona State University‡‡ University of Arizona‡‡	J D Barger M D	3 yrs	12	10	July	None
Memorial Hospital Phoenix	Arizona State University‡‡	M Rosenthal M D	3 yrs	12	2	Varies	None[1]
St Joseph s Hospital Phoenix	Arizona State University‡‡	F D Mann, M D	3 yrs	12	10	Feb June	None[1]
St Mary s Hospital, Tucson	University of Arizona‡‡	L Hirsch M D	3 yrs	12	3	Sept	None[1] B
Tucson Medical Center, Tucson	University of Arizona‡‡, Arizona State University‡‡	G T Schloss, M D	3 yrs	12	6	July	None[1]
ARKANSAS							
St Edward s Mercy Hospital, Fort Smith	College of the Ozarks‡‡ Arkansas Polytechnic College‡‡	A S Koenig, M D, L L Barta, M D	3 yrs	12	2	Quarterly	None B
Sparks Memorial Hospital, Fort Smith	College of the Ozarks‡‡ Arkansas Polytechnic College‡‡	A S Koenig M D, L L Barta M D	3 yrs	12	4	Varies	None B
St Vincent Infirmary, Little Rock	Little Rock University‡‡	M J Kilbury, M D, W S Orr Jr M D	2 yrs	13	8	Varies	$100
University of Arkansas Medical Center, Little Rock	University of Arkansas‡‡ Little Rock University‡‡	S W Ross M D	2 3 yrs	15	20	Sept	$180 B
Veterans Administration Hospital Little Rock		C F Shukers, M D	3 yrs	[illegible]	8	Varies	None
St Michael's Hospital, Texarkana		E H Wicker M D	2 yrs	12	4	Feb Sept	None
CALIFORNIA							
Kern County General Hospital, Bakersfield		R W Huntington Jr, M D	4 yrs	12	3	Varies	None[1]
St Joseph Hospital, Burbank		R Straus, M D	3 yrs	12	[illegible]	July	None[1]
Glendale School of Medical Technology, Glendale		G D Curtis M D	4 yrs	12	6	Varies	None[1]
Memorial Hospital of Long Beach, Long Beach*	Long Beach State College‡‡	E R Jennings M D	3 yrs	12	6	July Sept	None[1]
Veterans Administration Hospital, Long Beach	Long Beach State College‡‡	B E Konwaler, M D	2 3 yrs	12	8	Feb July	None
Cedars of Lebanon Hospital Los Angeles		N B Friedman, M D, H J Sacks, M D	4 yrs	12 18	8	Feb July	None[1]
Childrens Hospital Los Angeles		R S Cleland, M D	4 yrs	12	6	Varies	None[1]
Los Angeles County General Hospital, Los Angeles		E M Butt, M D	4 yrs	14	18	Monthly	None[1]
Mount Sinai Hospital and Clinic, Los Angeles		I Schoen, M D	2 yrs	12	2	Feb Sept	None[1]
St Vincent's Hospital, Los Angeles	Immaculate Heart College‡‡	R Shoemaker M D	4 yrs	12	4	July	None[1] B
Veterans Administration Center, Los Angeles	Mount St Mary's College‡	B G Fishkin M D	4 yrs	12	10	Feb	None
White Memorial Hospital Los Angeles	College of Medical Evangelists‡‡	O B Pratt, M D	3 yrs	15	20	Quarterly	$1[illegible]0

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
CALIFORNIA—Continued							
Kaiser Foundation Hospital, Oakland	San Francisco State College†	N I Morgenstern M D	3-4 yr	12	4	July	Univ [1]
Peralta Hospital Oakland		M S Bowman M D	4 yrs	12	3	Feb June	None[1]
Orange County General Hospital Orange		E B Reilly M D	4 yrs	12	2	Varies	None[1]
St. Joseph Hospital Orange		J B Tully M D	3 yrs	12	[illegible]	Varies	None[1]
Huntington Memorial Hospital, Pasadena		D S Shillam M D R D Lewis M D	4 yrs	12	10	July	None[1]
St Luke Hospital Pasadena*		I M Butt M D	4 yrs	12	[illegible]	Varies	None[1]
Mercy Hospital Redding		P Flynn M D J D Keye Jr M D	4 yrs	12	4	Quarterly	None[1]
Sacramento County Hospital Sacramento		R Hardie M D	4 yrs	12	8	Varies	None[1]
Monterey County Hospital Salinas	San Jose State College†	H C Crellin M D	4 yrs	12	[illegible]	Feb July	None[1]
San Bernardino County Charity Hospital San Bernardino		C H Lee M D	4 yr	12	3	Varies	None[1]
Mercy Hospital San Diego		D A DeSanto M D J L Heard M D	5 yrs	12	10	Jan July	None[1]
Rees-Stealy Medical Clinic San Diego		P J Gausewitz M D	4 yr	12	4	Varies	None[1]
Donald N Sharp Memorial Community Hospital San Diego		P L Gausewitz M D	4 yrs	12	10	July	None[1]
Children Hospital San Francisco		S I Nerenberg M D	4 yrs	12	4	July Sept	None[1]
Letterman General Hospital San Francisco	San Jose State College†	Lt Col M R Beck M C	3 yrs	12	10	July	None[1]
St Luke's Hospital San Francisco		M B Black M D	4 yrs	12	3	July	None[3]
University of California School of Medicine San Francisco	University of California†	W L Bostick M D	3 yrs	12	18	Sept	Univ
O Connor Hospital San Jose	San Jose State College†	L R Crams M D	3 yrs	12	8	Varies	None[3]
Santa Clara County Hospital San Jose	San Jose State College†	D J Alcott M D	2 yrs	12	6	Quarterly	None[1]
St John Hospital Santa Monica		G J Hummer M D	4 yrs	12	10	Quarterly	None[1]
Santa Monica Hospital Santa Monica		A A Kosky M D T L Young M D	4 yrs	12	3	Feb July	None[1]
Santa Rosa Memorial Hospital Santa Rosa		O F Thomas M D L J Kreisl M D	4 yrs	12	2	Varies	None[1]
Sonoma County Hospital Santa Rosa		O F Thomas M D	4 yrs	12	2	Varies	None[1]
Los Angeles County Harbor General Hospital Torrance	University of California at Los Angeles	S Madden M D C Johnston M D	4 yrs	12	5	Varies	None[1]
COLORADO							
Memorial Hospital Colorado Springs	Colorado College†	R F Dillon M D	3 yrs	12	4	June Sept	None[1]
Penrose Hospital Colorado Springs	Colorado College† Loretto Heights College† College of Mt St Joseph on the Ohio‡	J R Kraft M D	3 yr	12	8	July Sept	None[1]
St Francis Hospital Colorado Springs	Adams State College‡ College of St Teresa‡	R W Urich M D	2 yr	12	4	June Sept	None
Denver General Hospital Denver		W C White M D	2 yrs	12	6	Varies	None[3]
Mercy Hospital Denver	Loretto Heights College† Colorado Woman's College† College of Saint Mary† Colorado College‡	F Hildebrand M D R L Hawley M D	2 yrs	12	6	July	None[3]
St Anthony Hospital Denver	University of Denver†	S K Kurland M D	3 yrs	12	12	June Sept	Univ
St Joseph's Hospital Denver	Oklahoma College for Women†	S M P Ashe M D	2 yrs	12	3	Jan July	None[1]
University of Colorado School of Medicine Denver	University of Colorado†‡	J H Holmes M D	3 yrs	12	30	June	Univ B
Weld County General Hospital Greeley	Colorado State College†	J A Kidder M D D F Rector M D	3 yrs	12	4	Jan July	Univ [1]
Colorado State Hospital Pueblo	Western State College of Colorado†‡ Pueblo Junior College† Colorado College† Colorado State University†	M Callavan M D	2 yrs	12	13	Varies	None[1]
St Mary Corwin Hospital Pueblo		R Fargotstein M D	3 yrs	12	6	July	$30[1]
CONNECTICUT							
Hartford Hospital Hartford*	University of Connecticut†	R F Kendall M D	2 yrs	12	8	Sept	None[1]
St Francis Hospital Hartford	University of Connecticut† Springfield College‡ Quinnipiac College‡	J E Thayer M D	2 yrs	12	8	Sept	None[1]
Middlesex Memorial Hospital Middletown	University of Connecticut†‡ Springfield College† Quinnipiac College‡	C E McLeod M D	2 yrs	12	4	Oct	None
New Britain General Hospital New Britain	University of Connecticut†‡ Springfield College‡ Quinnipiac College†	P D Rosahn M D	2 yrs	12	5	Oct	None
Grace New Haven Community Hospital New Haven	Quinnipiac College† Colby Junior College†	A Liebow M D	2 yr	12	12	Sept	None
Hospital of St Raphael New Haven	University of Connecticut† Quinnipiac College†	R R Nesbit M D	2 yrs	12	12	Sept	None
Norwalk Hospital Norwalk	University of Connecticut† Quinnipiac College†	R N Barnett M D	2 yrs	12	5	Sept	None[2]
St Joseph's Hospital Stamford	Quinnipiac College†‡	P J Wick M D	3 yrs	12	2	Sept	None[1]
Stamford Hospital Stamford*	University of Connecticut† Colby Junior College‡ Quinnipiac College‡	F S Breakell M D	2 yrs	12	4	Sept	$200[1]
St Mary's Hospital Waterbury*	Quinnipiac College†‡	M E Cox M D	2 yrs	13	6	Sept	None[1]
Waterbury Hospital Waterbury[2]	University of Connecticut†‡ Colby Junior College‡ Quinnipiac College†	J O Collins M D	2 yrs	12	4	Sept	None
Windham Community Memorial Hospital Willimantic	Quinnipiac College†‡	M Z Rosenberg M D	2 yrs	12	2	Varies	None
DELAWARE							
Delaware Hospital Wilmington	University of Delaware†‡	J W Howard M D	3 yrs	12	6	June	None
Memorial Hospital Wilmington	University of Delaware†‡	J W Abbles M D	2-3 yr	12	6	June	None
Wilmington General Hospital Wilmington	University of Delaware†	J N Casella M D	2 yrs	12	4	July	None

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
DISTRICT OF COLUMBIA							
Doctors Hospital, Washington	American University†‡	O B Hunter, Jr M D	2 yrs	12	9	Quarterly	None[3]
George Washington University Hospital, Washington	George Washington University†‡	W L Marsh, M D	2 yrs	12	6	Fall	Univ[1]
Providence Hospital, Washington		K L McCoy, M D	2 yrs	12	8	Mar Sept	None[3]
Sibley Memorial Hospital, Washington	American University†‡	O B Hunter, Jr M D	2 yrs	12	9	Quarterly	None[3]
Washington Hospital Center, Washington		V E Martens M D	3 yrs	12	15	July	None
FLORIDA							
Florida State Hospital, Chattahoochee		R Mosteller, M D	2 yrs	12	5	Varies	None
Baptist Memorial Hospital Jacksonville		A G Foraker, M D	2 yrs	12	2	Feb[1] July	None[1]
Duval Medical Center, Jacksonville		J W Eversole, M D	2 yrs	12	6	July	None[1]
St Luke's Hospital, Jacksonville		D B Frazier, M D	2 yrs	12	6	Monthly	None[1]
St Vincent's Hospital, Jacksonville		C M Whorton M D J C Schaefer M D	2 yrs	12	6	Monthly	None[1]
Lakeland General Hospital, Lakeland	Florida Southern College†‡	F H DeLand M D	3 yrs	18	8	Feb	Univ
Jackson Memorial Hospital, Miami	University of Miami†‡	J B Miale M D	2 3 4 yrs	12	20	Sept	None
Mercy Hospital, Miami*		T C Keller, M D	2 yrs	12	4	Varies	None
Variety Children's Hospital, Miami		M Bevilacqua M D E Blum, M D	2 yrs	12	2	Feb Sept	None B
Mount Sinai Hospital, Miami Beach	University of Miami†‡	I Benson, M D	2 3 yrs	12	6	Varies	None
St Francis Hospital, Miami Beach*	Barry College†‡	V O Calderin M D G A Puente Duany, M D	3 yrs	12	2	July Sept	None[1]
Orange Memorial Hospital, Orlando		C G Butt M D	2 yrs	12	8	Varies	None[1]
Baptist Hospital, Pensacola		G V Squires M D	3 yrs	12	3	Jan July	None
Sacred Heart Hospital Pensacola	Pensacola Junior College†‡	G H Hilbert, M D	2 yrs	12	3	Quarterly	None
Mound Park Hospital, St Petersburg		I C Evans M D	2 yrs	12	10	Sept	None[1]
St Anthony's Hospital, St Petersburg*	St Petersburg Junior College	D K Davis, M D	2 yrs	12	6	Varies	None[1]
Tampa General Hospital, Tampa		R C Neale, M D	2 yrs	12	4	July	None
Tampa School of Medical Technology Tampa	University of Tampa†‡	J N Patterson M D	2 yrs	15	4	Sum Fall	None[1]
GEORGIA							
Phoebe Putney Hospital, Albany		C E Bridger M D	3 yrs	12	2	Varies	None[1]
Athens General Hospital, Athens		P W Warga, M D	2 yrs	12	2	June Sept	None[1]
St Mary's Hospital, Athens		P W Warga M D	2 yrs	12	2	June Sept	None[1]
Crawford W Long Memorial Hospital Atlanta		D Ayer, M D	2 yrs	12	12	Varies	None[1]
Emory University Hospital Atlanta*	Emory University†‡, Georgia State College for Women‡ Florida State University†‡ North Georgia College‡ Oglethorpe University†‡ Wesleyan College‡	A Golden M D	2 yrs	12	12	Jul Sept	None[1]
Georgia Baptist Hospital, Atlanta	Emory University	G L Forbes, Jr, M D H V Bell, Jr, M D	2 4 yrs	12	12	Varies	None[1]
Grady Memorial Hospital, Atlanta	North Georgia College†‡ Brenau College‡ Carson Newman College‡ Wesleyan College†‡ Oglethorpe University†‡ Madison College†‡ Flora MacDonald College†‡, University of Chattanooga†‡	T D Raaen M D	2 yrs	13	60	Monthly	None[1]
Piedmont Hospital Atlanta	Oglethorpe University†‡ Georgia State College for Women†‡	R B Vincenzi M D	4 yrs	12	6	Varies	None[1]
St Joseph's Infirmary, Atlanta	Emory University	J T Godwin M D	2 yrs	12	9	Jan July	None[1]
Veterans Administration Hospital, Atlanta	Oglethorpe University‡, Emory University	J Mendeloff, M D	2 3 yrs	12	4	Varies	None
University of Georgia and Medical College of Georgia, Augusta	University of Georgia†‡	W L Shepeard, M D	3 yrs	12	8	June Aug	$112 B
University Hospital, Augusta		M Ihnen M D	2 yrs	12	8	Jan July	None[3]
Medical Center, Columbus		F G Stephens, M D	2 yrs	12	5	Varies	None[1]
St Francis Hospital, Columbus		F Beckel, M D	2 yrs	12	4	Varies	None[1]
Macon Hospital, Macon*		W M Wyatt, M D	2 yrs	12	6	Sept	None
Kennestone Hospital, Marietta		W B Matthews, M D	2 yrs	12	4	June Sept	None[1]
Pineview General Hospital Valdosta	Valdosta State College†‡	B S Davis, M D	3 yrs	12	4	Sept	Univ
HAWAII							
Kuakini Hospital Honolulu	University of Hawaii†‡	G N Stemmermann M D	3 yrs	12	2	June	Univ
Queen's Hospital, Honolulu	University of Hawaii†‡	W H Civin M D	3 yrs	12	6	July	None
St Francis Hospital Honolulu	University of Hawaii†‡	R Chappell M D	2 yrs	12	3	July	None
Tripler U S Army Hospital, Moanalua, Oahu	University of Hawaii†‡	Col H B Hoeffler M C	2 yrs	12	20	June	None
IDAHO							
St Alphonsus Hospital, Boise	College of Idaho†‡ Idaho State College†‡	M E Thomas M D	2 yrs	12	4	Monthly	None[1]
St Luke's Hospital Boise	College of Idaho†‡ Idaho State College†‡ University of Idaho†‡	I C McCarter M D	2 yrs	12	6	Jan July	None[1]
Idaho Falls Hospital, Idaho Falls	Ricks College†‡ Idaho State College‡ Utah State University†‡ Brigham Young University†‡	B Giddings M D	2 3 yrs	12	3	Varies	None
Sacred Heart Hospital, Idaho Falls	Idaho State College†‡	J A Williams M D	2 yrs	12	3	Quarterly	None[1]
St Joseph's Hospital, Lewiston		D K Merkeley M D	3 yrs	12	2	Varies	None[1]
Bannock Memorial Hospital, Pocatello	Idaho State College†‡	F B Webb M D	3 yrs	12	4	July	None[3]
Magic Valley Memorial Hospital, Twin Falls		J W Creed, M D	3 yrs	12	3	Sept	None[1]
ILLINOIS							
Copley Memorial Hospital, Aurora	Aurora College†‡	P T Dolan M D G P Swiderek M D	2 yrs	12	4	Varies	None[1]
St Joseph's Hospital, Bloomington	Illinois Wesleyan University†‡	A Schweitzer, M D J E Maloney M D	2 yrs	12	4	Varies	[illegible]

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
ILLINOIS—Continued							
Burnham City Hospital Champaign*		M Appel M D	2 yrs	12	2	June Sept	None[1]
Alexian Brothers Hospital Chicago	DePaul University†♦	G F Stevenson M D	2 yrs	12	2	Varies	$50[1]
American Hospital Chicago		W F Fi enstaedt M D	2 yr	12	2	Varies	None[1]
Augustana Hospital Chicago	Augustana College‡	G Mille M D T C Erwin M D	3 yrs	12	5	Varies	$150
Chicago Wesley Memorial Hospital Chicago	Northwestern University	T C Laipply M D	2 yrs	12	24	Monthly	$200
Evangelical Hospital of Chicago Chicago		G T Rich M D	2 yrs	12	4	Quarterly	None[3]
Grant Hospital of Chicago Chicago		J C Sherrick M D	2 yrs	12	3	Varies	$50[1]
Hospital of St Anthony de Padua Chicago		A T Mosquera M D	2 yrs	12	6	Varies	None[1]
Illinois Masonic Hospital Chicago		I S King M D	2 yrs	15	4	May Sept	None[1]
Michael Reese Hospital Chicago	Roosevelt University†‡ North Central College‡ College of Idaho† DePaul University†‡ St Mary s College‡	O Saphir M D	2 yrs	12	12	Monthly	$150
Mount Sinai Hospital Chicago	Roosevelt University†‡ DePaul University†*	I Davidsohn M D	3 yrs	12 18	16	Varies	$150 B
Northwestern University Medical School (Passavant Memorial Hospital) Chicago	Northwestern University†‡	O F Hepler M D	2 3-4 yrs	12 24	13	Varies	$175
Presbyterian St Luke s Hospital Chicago	DePaul University†‡ Roosevelt University†‡	F C Bauer M D	2 yrs	18	15	Varies	None[1]
St Anne s Hospital Chicago		J B Hartney M D	2 yrs	12	4	Mar Sept	None[1]
St Bernard s Hospital Chicago	Loyola University†	C S Hagerty M D	2 yrs	12	3	Sept	$50
St Joseph Hospital Chicago	DePaul University†‡	G F Stevenson M D	2 yrs	12	6	Varies	None
St Mary of Nazareth Hospital Chicago	DePaul University†‡ Mundelein College†♦	M C Godwin M D	2 yrs	12	10	Feb Sept	None[1]
St James Hospital Chicago Heights		P T Fagan M D	2 yrs	12	4	Quarterly	$251
Lake View Memorial Hospital Danville	Bradley University†‡ Illinois Wesleyan University†♦ Eastern Illinois University†*	D B Dorsey M D	2 yrs	12	6	Feb Sept	None
Decatur and Macon County Hospital Decatur	Millikin University†‡ Bradley University†♦ Illinois Wesleyan University†*	O C Brosius M D	2 yrs	12	14	Monthly	None[1]
Evanston Hospital Evanston	DePauw University†‡	C B Taylor M.D H B Harding M D	3 yrs	12 18	8	Quarterly	None[1]
St Francis Hospital Evanston*	DePaul University†‡ College of St Teresa‡ Holy Names College†♦ Mt Mary College†‡ Alverno College†♦	J W Henry M D	3 yrs	12	5	Varies	$50
Little Company of Mary Hospital Evergreen Park*	DePaul University†‡ St Xavier s College‡	J J Moore M D	3 yrs	12	6	June Sept	$100
Deaconess Hospital Freeport		F C Tucker M D	2 yrs	12	2	Varies	None[1]
Ingalls Memorial Hospital Harvey	Lewis College‡	R Greene M D	2 yrs	12	4	Sept	None[1]
Hinsdale Sanitarium and Hospital Hinsdale	Emmanuel Missionary College†‡ Washington Missionary College†*	C L Dale M D	2 yrs	12	6	Mar Sept	None[1]
Quad City Hospitals	Monmouth College Monmouth†‡ Marycrest College Davenport Ia †‡ St Ambrose College Davenport Ia †‡ State University of Iowa‡						
Moline Public Hospital Moline	as above	W S Phetteplace M D	2 3 yrs	12	15	Varies	None[3]
St Anthony Hospital Rock Island	as above	W S Phetteplace M D	2 3 yrs	12	15	Varies	None[3]
West Suburban Hospital Oak Park		G Kent M D	3 yrs	12 15	2	Feb Sept	None
Methodist Hospital Peoria	Bradley University†‡	H I Brown M D	2 yrs	12	10	June Sept	None[1]
St Francis Hospital Peoria	Bradley University†‡ College of St Francis†‡	D D Mark M D	2 yrs	12	14	June Sept	None[1]
Blessing Hospital Quincy	Hannibal LaGrange College†‡ Culver Stockton College‡	L Stefan M D	2 yrs	12	10	Feb July	None[1]
St Mary s Hospital Quincy	Quincy College†‡	J P Kiselis M D	3 yrs	12	2	Varies	None[1]
Rockford Memorial Hospital Rockford	Rockford College†‡	M O Alexander M D K M Truemner M D	2 yrs	12	7	July Sept	None[3]
St Anthony Hospital Rockford	Rockford College†‡	A R K Matthews M D	2 yrs	12	8	Varies	None[1]
Swedish American Hospital Rockford	Rockford College†‡	P A Van Pernis M D R V Hoffman Jr M D	3 yrs	12	6	July	None[1]
Memorial Hospital Springfield		G C Johnson M D	3 yrs	12	5	Varies	None[1]
St John s Hospital Springfield	Quincy College†♦	G E Fox M D	3 yrs	12	12	Sept	$50
Carle Foundation Urbana*		H P Friedman M D	3-4 yrs	12	5	Oct	$100[1]
St Therese s Hospital Waukegan*	DePaul University†‡ Mundelein College†‡	G J Rukstinat M D	3 yrs	12	8	Sept	None
INDIANA							
St John s Hickey Memorial Hospital Anderson	Anderson College‡ Ball State Teachers College†‡	D L Buckles M D	2 yrs	12	5	Varies	Univ [1] B
Protestant Deaconess Hospital Evansville	Evansville College†‡	F E Mills M D	2 yrs	12	4	Varies	None
St Mary s Hospital Evansville	Evansville College†‡	F W Porro M D	3 yrs	12	10	June Sept	Univ
Lutheran Hospital Fort Wayne		W D Griest M D	2 yrs	12	12	Varies	None
Parkview Memorial Hospital Fort Wayne		K R Schlademan M D	2 yrs	12	4	June July	None
St Joseph s Hospital Fort Wayne	St Francis College†‡	L A Schneider M D	2 yrs	12	4	Quarterly	None
Methodist Hospital of Gary Gary		R A Burger M D W P Loh M D	2 yrs	12	10	Varies	None[1]
St Mary s Mercy Hospital Gary		E J Shalgos M.D J D Whitaker M D	2 yrs	12	2	Varies	None
St Margaret s Hospital Hammond	St Francis College†‡	J Pilot M D	2 yrs	12	6	Varies	None B
Indiana University Medical Center Indianapolis	Indiana University†‡	J L Arbogast M.D	3 yrs	12	16	June	$210
Methodist Hospital Indianapolis*	Butler University†* Franklin College†‡ DePauw University†‡ Ball State Teachers College‡	L H Hoyt M.D	4 yrs	12	12	Quarterly	$50[3]
St Vincent s Hospital Indianapolis	Marian College†‡	L N Foster M D	2 yrs	12	8	Feb Sept	None[1]

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
MASSACHUSETTS—Continued							
Holyoke Hospital, Holyoke	Springfield College‡ Westbrook Junior College‡ Holyoke Junior College‡	H P Wakefield MD	2 yrs	12	6	July Sept	None¹
Lawrence General Hospital Lawrence	Merrimack College†‡	T S Jolliffe MD	2 yrs	12	4	Sept	None¹
Malden Hospital Malden*	Colby Junior College‡	M A MacKenzie MD	2 yrs	12	6	Sept	None B
Bon Secours Hospital Methuen	Merrimack College†‡	M D Howard MD	2 yrs	12	2	July Oct	None¹
St Luke's Hospital New Bedford		A Kiarsis MD	2 yrs	12	6	Jan July	None¹
Newton Wellesley Hospital Newton Lower Falls		D Skinner, MD	2 yrs	12	6	July Oct	None
Pittsfield General Hospital Pittsfield	Bennington College†‡	W Beautyman, MD	2 yrs	12	6	Jan July	None¹
St Luke's Hospital, Pittsfield	College of Our Lady of the Elms†‡	C MacGaffey MD	3 yrs	15	1	Varies	None¹
Quincy City Hospital Quincy	Eastern Nazarene College†‡	R B Street Jr, MD	2 yrs	15	6	Varies	None¹
Salem Hospital, Salem		D A Nickerson MD	2 yrs	12	4	Sept	None
Mercy Hospital Springfield	College of Our Lady of the Elms†‡	J Rim MD	2 yrs	12	8	Varies	None¹
Springfield Hospital, Springfield	Springfield College†‡ American International College†‡ Colby Junior College‡	W Kaufmann MD	2 yrs	12	8	Quarterly	None
Tewksbury Hospital Tewksbury*		H S Glidden MD	4 yrs	12	2	July	None
Memorial Hospital Worcester		R C Sniffen MD	2 yrs	12	4	Feb July	None¹
St Vincent Hospital Worcester		W Casale, MD	2 yrs	12	8	July Sept	None¹
Worcester City Hospital Worcester	Worcester Junior College‡	W F MacGillivray MD	2 yrs	12	8	Sept	None
MICHIGAN							
St Joseph Mercy Hospital Ann Arbor	Eastern Michigan University†‡	H C Bryant Jr MD	3 yrs	12	10	July	None¹
University of Michigan Hospital Ann Arbor	University of Michigan†‡	A J French MD	3 yrs	12	20	June	Univ
Leila Y Post Montgomery Hospital Battle Creek		A A Humphreys MD W D Walters MD	3 yrs	12	4	Varies	None
Mercy Hospital Bay City	Michigan State University†‡ Bay City Junior College†‡ Michigan College of Mining and Technology†‡	W G Gamble, Jr MD J L Langin MD	3 yrs	12	3	Varies	None¹
Mercy Hospital Benton Harbor		R J Lininger MD	3 yrs	12	4	Sept	None¹
Oakwood Hospital, Dearborn*	Wayne State University†‡ Michigan State University†‡	R L Mainwaring MD	3 yrs	12	4	Quarterly	Univ³
Veterans Administration Hospital Dearborn	Wayne State University	J Shrager MD J F Burton MD	3 yrs	12	8	Jan	None
Detroit Memorial Hospital, Detroit*	Wayne State University†‡	J D Langston MD	2-3 yrs	12	12	Varies	None¹
Evangelical Deaconess Hospital-Jennings Memorial Hospital, Combined School Detroit		J J Fennessey, MD A Golden, MD	2 yrs	12	6	Varies	None¹
Grace Hospital, Detroit	Michigan State University†‡ Madonna College†‡	C I Owen MD	2 yrs	12	16	Varies	None¹
Harper Hospital Detroit	Michigan College of Mining and Technology†‡ Michigan State University†‡, Central Michigan University†‡ Northern Michigan College†‡	J R McDonald MD	3 yrs	12	10	Varies	None¹
Henry Ford Hospital, Detroit	Wayne State University†‡	R C Horn Jr, MD	4 yrs	18	18	Sept	None
Herman Kiefer Hospital Detroit	Marygrove College†‡	P C Martineau MD	3-4 yrs	12	12	Monthly	$25
Mount Carmel Mercy Hospital Detroit*	Mercy College†‡	J W Gardner MD J G Wolter MD	3 yrs	12	12	June	Univ
Providence Hospital, Detroit	Wayne State University†‡ Siena Heights College†‡ University of Detroit†‡	D H Kamp, MD C A Velat MD	3 yrs	12	12	July Sept	None¹
Receiving Hospital Detroit	Wayne State University†‡	I Berman MD	3 yrs	12	12	July	Univ³
St John Hospital Detroit*	University of Detroit†‡ Nazareth College†‡	G F Fritz MD	3 yrs	12	8	July	None¹
Woman's Hospital Detroit*	Wayne State University†‡	F T Muirhead MD	3 yrs	12	6	July	None¹
Wayne County General Hospital, Eloise	Michigan State University†‡ Michigan College of Mining and Technology†‡	S J Gould MD	3 yrs	12	11	July	None¹
Hurley Hospital, Flint		F M Knights, Jr MD	3 yrs	12	6	Varies	None¹
McLaren General Hospital Flint		F G Murphy, MD W J Eaton MD	3 yrs	12	6	Monthly	None¹
St Joseph Hospital Flint	Nazareth College†‡ Michigan College of Mining and Technology†‡	W J Eaton, MD	3 yrs	12	6	July	None¹
Blodgett Memorial Hospital, Grand Rapids	Western Michigan University†‡ Michigan State University†‡ Calvin College†‡	C A Payne MD	3-4 yrs	12	9	Monthly	None¹
Butterworth Hospital Grand Rapids	Calvin College†‡ Aquinas College†‡ Western Michigan University†‡	J D Mann MD	2 yrs	12	10	Varies	None¹
St Mary's Hospital, Grand Rapids	Aquinas College†‡ Calvin College†‡ Michigan State University†‡ Western Michigan University†‡	H I Bowman MD	3 yrs	12	7	July	None¹
Borgess Hospital Kalamazoo	Western Michigan University†‡ Nazareth College†‡	P S Rutherford, MD	3 yrs	12	6	July	None¹
Bronson Methodist Hospital Kalamazoo	Western Michigan University†‡ Albion College†‡	D E Glaser MD	3 yrs	12	6	Varies	None¹
Edward W Sparrow Hospital Lansing		J F Dunkel MD	3 yrs	12	6	Varies	None¹
St Lawrence Hospital, Lansing	Michigan College of Mining and Technology†‡	L W Walker MD	3 yrs	12	6	July	None¹
Hackley Hospital Muskegon	Muskegon Community College‡	H DeLeeuw MD	2 yrs	12	8	June	None¹

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MICHIGAN—Continued							
Little Traverse Hospital Burns Clinic Petoskey	North Central Michigan College	I H Webster M D	2 yrs	12	4	July	None[1]
Pontiac General Hospital Pontiac	Michigan State University†* Muskegon Junior College†	J J Marra M D	2 yrs	12	7	Jan July	None[1]
Port Huron Hospital Port Huron	Port Huron Junior College	F I Tame M D	2 yrs	12	3	Varies	None[1]
Saginaw General Hospital Saginaw	Michigan State University†*	R Bucklin M D	3 yrs	12	4	July	None[1]
St Luke's Hospital Saginaw	Albion College†* Madonna College† Michigan State University† Central Michigan University† Alma College†	T F Bratrud M D	2 yrs	12	10	Jan July	None[1]
MINNESOTA							
St Luke's Hospital Duluth	Wisconsin State College† Hamline University† Northland College†,	A H Weil M D	2 yrs	12	8	Feb July	None
St Mary's Hospital Duluth	College of St Scholastica†, Wisconsin State Teachers College†	A C Aufderheide M D	2-3 yrs	12	15	Varies	None[1]
St Joseph's Hospital Mankato	Mankato State College†*	R A Sanford M D	2 yrs	12	3	Varies	None[1]
Minneapolis General Hospital Minneapolis	Gustavus Adolphus College† Augsburg College†*	J I Coe M D	3 yrs	12	18	Varies	None
Northwestern Hospital Minneapolis		F H Lott M D	3-4 yrs	12	8	Monthly	None
St Mary's Hospital Minneapolis		W Subby M D A Judd M D	4 yrs	12	8	Varies	None[1] B
Swedish Hospital Minneapolis	Wartburg College† Augsburg College† South Dakota State College† Wisconsin State College† Gustavus Adolphus College†	A R Jay M D D P Reynolds M D	2 yrs	12	12	Varies	None[1]
University of Minnesota Minneapolis	University of Minnesota†	G T Evans M D	3 yr	12	60	Quarterly	Univ
St Cloud Hospital St Cloud		A F Davis M D	3 yrs	12	10	Sept	None[1]
Ancker Hospital St Paul	Hamline University†, St Theresa's College† South Dakota State College†	J F Noble M D	2 yrs	12	6	July	None
Charles T Miller Hospital St Paul	Macalester College†	K Ikeda M D	3-4 yrs	12	12	Varies	None
St Joseph's Hospital St Paul	College of St Catherine	E M Tame M D	2 yrs	12	6	Quarterly	None[1]
MISSISSIPPI							
Mississippi Baptist Hospital Jackson	University of Mississippi†* Mississippi State University†* Mississippi Southern College†,	K M Heard M D L Schiesari M D	3 yrs	12	12	Quarterly	None[1]
University of Mississippi Medical Center Jackson	University of Mississippi† Mississippi State College† Mississippi Southern College†‡ Delta State College†‡ Millsaps College†	W N Bell M D	3 yrs	15	12	Varies	None[1]
North Mississippi Community Hospital Tupelo	University of Mississippi†* Mississippi State University†	J C Costley M D	2 yrs	12	6	Feb Sept	None[1]
Mercy Hospital Vicksburg	Mississippi State College† Mississippi Southern College†	R H Fenstermacher M D	3 yr	15	10	Varies	None[1] B
MISSOURI							
St Louis County Hospital Clayton		R O Muether M D J Wyatt M D	2 yrs	12	8	Quarterly	None
University of Missouri Medical Center Columbia	University of Missouri†	M P Neal M D	2-3 yrs	12	10	Feb Aug	Univ
Independence Sanitarium and Hospital Independence	University of Kansas City†*	J C Bridgens M D	2 yrs	12	4	Quarterly	None[1]
St John's Hospital Joplin		R I Ferguson M D	2 yrs	12	3	Jan Sept	None[1]
Kansas City General Hospital Kansas City	University of Kansas City†‡ College of St Teresa†, Oklahoma College for Women† Southwestern State College†*	C B Wheeler M D	2 yrs	12	11	Varies	None[1]
Menorah Medical Center Kansas City	University of Kansas City† Baker University†*	H Cohen M D	2 yrs	12	10	Varies	None[1]
Research Hospital Kansas City*	Missouri Valley College† University of Kansas City†,	H K B Allebach M D	2 yrs	12	12	Monthly	None[1]
St Joseph Hospital Kansas City	College of St Teresa†	R W Kerr M D	4 yrs	12	8	Monthly	None[2] B
St Luke's Hospital Kansas City	Missouri Valley College† College of St Teresa†* University of Kansas City†,	F C Helwig M D	2 yrs	15	22	Monthly	None[1]
St Mary's Hospital Kansas City	Webster College† Marymount College† Mt St Scholastica College*, Kansas City University†	A Lapi M D	2 yrs	12	15	Varies	None B
Trinity Lutheran Hospital Kansas City*	Bethany College† University of Kansas City†‡ Missouri Valley College†,	J H Hill M D	3 yrs	12	6	Sept	None[2]
F C Thompson Foundation St Joseph*	Tarkio College†* Mt St Scholastica†	R N Riddell M D	3 yr	12	6	Varies	None[1]
Missouri Methodist Hospital St Joseph		M W Morse M D	2 yrs	12	6	Quarterly	None[1]
Barnes Hospital St Louis	Washington University	V Loeb Jr M D	2 yrs	12	4	Sept	$100
DePaul Hospital St Louis	Webster College‡	J D Bauer M D	2 yr	12	6	Varies	$100[1]
Homer G Phillips Hospital St Louis	Xavier University† Tougaloo Southern Christian College†	J O Blache M D	2 yr	12	12	Varies	None
Jewish Hospital St Louis	Washington University	J Hasson M D	2 yrs	16	6	Apr Oct	None
Missouri Baptist Hospital St Louis	William Jewell College Hannibal LaGrange College Southwest Baptist College	W R Platt M D	2 yr	12	7	Quarterly	$100
St John's Hospital St Louis	Fontbonne College†* Maryville College† Webster College†	W J Drake Jr M D	3 yrs	12	6	July Sept	None

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
MISSOURI—Continued							
St Louis University, St Louis	St Louis University†	G Gantner MD	3 yrs	12	4	June Aug	Univ
St Louis City Hospital St Louis	Spring Hill College†‡	D S Johnson, MD	2 yrs	12	8	Monthly	None
Burge Hospital, Springfield	Drury College‡, Southwest Missouri State College‡, Kansas State College‡	E B Hanan MD A S Smith MD	3 yrs	12	6	May Sept	None[1]
St John's Hospital, Springfield	Southwest Missouri College‡	F C Coller, MD	3 yrs	12	6	Varies	$25 B
MONTANA							
St Vincent Hospital, Billings	Greater University of Montana†‡ Carroll College‡, Rocky Mountain College†‡	B J Winter, MD	2-3 yrs	12	7	July Sept	None
Butte Community Hospital, Butte	Montana State College	R F Peterson, MD	3 yrs	12	4	June July	None[3]
St James Hospital, Butte		J A Newman MD	3 yrs	12	4	Varies	None[1]
Columbus Hospital Great Falls	College of Great Falls‡ Carroll College‡	J Pfaff, Jr, MD	3 yrs	12	5	July Oct	None[1] B
Montana Deaconess Hospital Great Falls	Montana State College‡	J J Eichwald, MD	2 yrs	12	6	Jan July	None[1]
NEBRASKA							
Mary Lanning Memorial Hospital Hastings	Hastings College‡	L R Wagner, MD	2 yrs	12	3	Varies	None[1]
Bryan Memorial Hospital Lincoln	Nebraska Wesleyan University†‡	F H Tanner MD	2 yrs	12	14	Varies	None B
Lincoln General Hospital, Lincoln		F H Tanner, MD	2 yrs	12	10	Varies	None
Bishop Clarkson Memorial Hospital Omaha	Municipal University of Omaha†‡	M Foster MD	2 yrs	12	12	Varies	$25
Creighton Memorial St Joseph Hospital, Omaha	Creighton University†‡	V Moragues MD	2-3 yrs	12	10	Feb June	None
University of Nebraska Hospital, Omaha	University of Nebraska†‡	J R Schenken, MD M H Kulesh, MD	2 yrs	12	16	Varies	Univ
West Nebraska General Hospital Scottsbluff	Chadron State Teachers College†‡	W O Brown MD	3 yrs	12	3	Varies	Univ
NEVADA							
St Mary's Hospital, Reno	University of Nevada‡	J Parsons, MD	2 yrs	12	4	June	None[1]
Washoe Medical Center, Reno	University of Nevada†‡	V A Salvadorini, MD	3 yrs	12	3	June	None[1]
NEW HAMPSHIRE							
Mary Hitchcock Memorial Hospital Hanover	University of New Hampshire†‡	J J French MD	2 yrs	12	10	Varies	None[1]
Notre Dame Hospital, Manchester		R J Biron MD	2 yrs	10	4	Varies	None[1]
NEW JERSEY							
Atlantic City Hospital, Atlantic City		M Ackerman MD	3 yrs	16	1	Varies	$75[3]
Clara Maass Memorial Hospital, Belleville		L Albano MD	3 yrs	16	1	Jan Sept	$100 B
Elizabeth General Hospital Elizabeth	Fairleigh Dickinson University†‡	J P Greeley MD	2 yrs	12	4	Oct	None[1]
Englewood Hospital, Englewood		J A Gaspar, MD	2 yrs	12	4	June Sept	None[1]
Hackensack Hospital, Hackensack[2]	Fairleigh Dickinson University†‡	D F Brown MD	3 yrs	12	3	July	None[1]
Monmouth Medical Center Long Branch		M R Rush MD	3 yrs	12	4	Varies	$100[1]
Mountainside Hospital Montclair		J J Work MD	4 yrs	15	4	July	None[1]
Morristown Memorial Hospital Morristown*	Fairleigh Dickinson University†‡	H F Luddecke MD	3 yrs	12	2	June	None[1]
Fitkin Memorial Hospital, Neptune*		E A Dawson, MD	2 yrs	12	5	June Sept	None[1]
Newark Beth Israel Hospital Newark	Rutgers University†‡	L M Goldman MD	3 yrs	12	12	June	Univ
Presbyterian Hospital, Newark	Fairleigh Dickinson University†‡ Rutgers University†‡	S J Goldberg MD	3 yrs	12	6	June Sept	Univ [1]
St Barnabas Medical Center Newark*	Fairleigh Dickinson University†‡ Rutgers University†‡ Wagner College‡	W G Bernhard MD	3 yrs	12	4	Sept	None[1]
St Michael's Hospital, Newark	Fairleigh Dickinson University†‡ Rutgers University†‡, Central State College‡	S J Rose MD	3 yrs	12	4	Sept	None[1]
Middlesex Hospital, New Brunswick		S L Moolten, MD	3 yrs	18	4	Varies	None[1]
Orange Memorial Hospital, Orange		A R Abel MD	2 yrs	12	2	Varies	None[3]
Bergen Pines County Hospital Paramus*	Fairleigh Dickinson University†	D Roth MD	2 yrs	12	10	July	None[1]
Passaic General Hospital Passaic	Fairleigh Dickinson University†‡	J R Gannon MD	3 yrs	12	2	Varies	None[1]
St Mary's Hospital, Passaic	Fairleigh Dickinson University†‡	R Brill MD	2 yrs	12	4	Mar Sept	None[1] [3]
Barnert Memorial Hospital Paterson	Fairleigh Dickinson University†‡	J Chung, MD	2 yrs	12	5	Varies	None[1]
Paterson General Hospital Paterson	Fairleigh Dickinson University†‡	A H Davis MD	2 yrs	12	1	Varies	None[3]
St Joseph Hospital Paterson		P Steinlauf MD	3 yrs	12	6	Varies	None[1]
Muhlenberg Hospital, Plainfield		H Hansen MD	3 yrs	12	2	July	None
Princeton Hospital Princeton*	Bennington College‡	T S Harvey MD	3 yrs	12	4	Oct	None
Valley Hospital, Ridgewood*		H P Price, MD	3 yrs	12	1	July	None[3]
Somerset Hospital, Somerville*		A P Gewanter, MD A S Conston MD	2 yrs	12	2	Sept	None[1]
Overlook Hospital, Summit	Fairleigh Dickinson University†‡	G J Erdman MD	2 yrs	12	4	Sept	None
Holy Name Hospital, Teaneck	Fairleigh Dickinson University†‡	N H Bigelow MD	3 yrs	12	4	Varies	None[1]
Mercer Hospital, Trenton	Rider College‡ Trenton Junior College‡	T K Rathmell MD	2 yrs	11	5	Varies	$100[2]
St Francis Hospital, Trenton	Rider College‡ Trenton Junior College‡ St Francis College, Loretto Pa†‡	S Weintraub MD	3 yrs	14	10	June Sept	None
Newcomb Hospital, Vineland		M N Solomon, MD	3 yrs	12	2	Varies	None[1]
NEW MEXICO							
Bernalillo County Indian Hospital Albuquerque	University of New Mexico†‡	H V Beighley MD	2 yrs	12	5	Varies	None
Lovelace Foundation for Medical Education and Research, Albuquerque	University of New Mexico†‡	P V VanSchoonhoven MD T L Chiffelle, MD	3 yrs	12	6	Mar Sept	None
St Joseph Hospital Albuquerque		H V Beighley MD	3 yrs	12	2	Varies	None

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NEW MEXICO—Continued							
Veterans Administration Hospital Albuquerque	University of New Mexico‡	W Hentel MD	3 yrs	12	3	Varies	None
St Vincent Hospital Santa Fe	College of St Joseph College of Mt St Joseph on the Ohio	H D Ellis MD	2 yrs	12	2	Varies	None[1]
NEW YORK							
Albany Medical Center Albany	Russell Sage College†*	W A Thomas MD	2 yrs	12	6	July	None
Bender School of Medical Technology Albany	Union University†	J J Clemmer MD	2 yr	18	22	Sept	$200
Cayuga County Laboratory Auburn		A E Harris MD	2 yr	12	4	Sept	None[1]
Binghamton General Hospital Binghamton	Hartwick College†,	N W Elton MD	2 yrs	12	6	July Sept	None[1]
Our Lady of Lourdes Memorial Hospital Binghamton		J S Crewal MD	2 yrs	12	3	June July	None[3]
Lawrence Hospital Bronxville		A A Eggston MD	2 yrs	12	4	Varies	None[1]
Prospect Heights Hospital Brooklyn	Central State College Wilberforce O†	S H Polayes MD	2 yrs	12	3	Varies	None B
St John's Episcopal Hospital Brooklyn		J M Fox MD	2 yrs	12	4	Fall	None
St Mary's Hospital Brooklyn		W Moitire Jr MD	2 yr	12	8	Mar Sept	None
Buffalo General Hospital Buffalo	University of Buffalo†,	S J Vaughan MD	[illegible] yr	12	26	Monthly	[illegible][3]
Edward J Meyer Memorial Hospital Buffalo	University of Buffalo†* D'Youville College†,	S Sanes MD	2 yrs	12	[illegible]	July Aug	None[1]
Mercy Hospital Buffalo	Rosary Hill College†	A B Constantine MD	3 yrs	12	10	Sept	Univ
Millard Fillmore Hospital Buffalo	University of Buffalo†*	A Postoloff MD	2 yrs	12	7	June Aug	None[1]
E J Noble Hospital Canton	St Lawrence University†	R J Rogers MD	3 yrs	12	[illegible]	June	$1100[1]
Arnot Ogden Memorial Hospital Elmira	Elmira College†	W D Kelly MD	2 yrs	12	2	Varies	None
St Joseph's Hospital Elmira	Nazareth College†	J A Mitchell MD	2 yrs	12	8	June Sept	None
Flushing Hospital Flushing		I Carrow MD	2 yr	12	4	Varies	None
Meadowbrook Hospital Hempstead	Adelphi College	A S Palladino MD	2 yrs	12	10	July	None[1]
Mary Immaculate Hospital Jamaica	St John's University†*	J J Hartnett MD	3 yrs	12	[illegible]	June	None
Charles S Wilson Memorial Hospital Johnson City		A A Kosinski MD	2 yrs	12	4	Sept	None[1]
Northern Westchester Hospital Mt Kisco		R A Fox MD	2-4 yr	12	4	Varies	None[1]
St Luke's Hospital Newburgh	Mount Saint Mary College†	J P B Payne MD	2 yrs	12	4	July Sept	None[1]
Beth Israel Hospital New York	New York University†	W Antopol MD	2 yr	12	4	Varies	None
St Barnabas Hospital for Chronic Diseases New York		N H Bigelow MD	2 yrs	12	4	July Sept	None[1]
St Clare's Hospital New York		J M Ravid MD	2 yr	12	3	Oct	None B
St Vincent's Hospital New York		A Rottino MD	2 yrs	12	8	July Sept	None
A Barton Hepburn Hospital Ogdensburg		J F Majeranowski MD	2 yrs	12	[illegible]	Sept	None[1]
United Hospital Port Chester		J F Young MD	2 yr	12	6	July Sept	None[1]
Rochester General Hospital Rochester		M C Bohrod MD	2 yr	18	12	Sept	$100
St Mary's Hospital Rochester	Nazareth College†,	J Adler MD	2 yrs	12	7	June Sept	None[1]
Ellis Hospital Schenectady	Russell Sage College†, Hartwick College†	C F Parkhurst MD	2 yrs	12	12	Varies	None[1]
Staten Island Hospital Staten Island	Notre Dame College†	A Altmann MD	3 yr	12	4	Varies	None[1]
U S Public Health Service Hospital Staten Island	Wagner College†	J J Perrin MD K R Sohlberg MD	2 yrs	12	6	Sept	None
St Joseph's Hospital Syracuse		H J Dick MD	2 yrs	12	6	Sept	None[1]
St Mary's Hospital Troy		A A Stein MD	2 yrs	12	4	July	None
Samaritan Hospital Troy	Russell Sage College†	C C Burn MD	3 yr	12	4	Varies	None[1]
St Luke Memorial Hospital Utica	Syracuse University†*	C F Davis MD	2-3 yrs	12	10	July Sept	Univ[1]
NORTH CAROLINA							
Memorial Mission Hospital Asheville	Western Carolina College†	C R Lacy Jr MD	2 yr	12	4	Varies	None
St Joseph's Hospital Asheville*	Western Carolina College†, Belmont Abbey College†	R W Morrison MD	2 yrs	[illegible]	6	Sept	None[1]
University of North Carolina School of Medicine Chapel Hill	Woman's College of the University of North Carolina†‡	W J Cromartie MD	2 yrs	12	[illegible]	Varies	Univ
Charlotte Memorial Hospital Charlotte	Queens College†,	F G Germuth Jr MD	2 yrs	12	6	June Aug	None B
Mercy Hospital Charlotte	Belmont Abbey College†,	J H Byrnes MD	2 yrs	12	12	Sept	None B
Presbyterian Hospital Charlotte	Lenoir Rhyne College†, Flora MacDonald College†‡	H J Large MD	2 yrs	12	5	Aug	None B
Cabarrus Memorial Hospital Concord		T O Williams MD	3 yrs	12	4	June Sept	$100[1, 3]
Duke University Medical Center Durham	Duke University†‡	W W Smith MD	2 yrs	12	18	Feb Sept	$75
Watts Hospital Durham		J C Gunter MD	2 yr	12	8	Jan July	None
Gaston Memorial Hospital Gastonia*	Belmont Abbey College†,	W B Kingsley MD	2 yrs	12	4	Sept	None B
Moses H Cone Memorial Hospital Greensboro	Woman's College of the University of North Carolina	H Z Lund MD	4 yrs	12	8	June Sept	None[1]
High Point Memorial Hospital High Point*		H A Horn MD	3 yr	12	2	Sept	None[1]
Rex Hospital Raleigh	Flora MacDonald College†	J B Wilson MD	[illegible] yrs	18	8	Jan July	None[1]
James Walker Memorial Hospital Wilmington	Wilmington College†	C D Lumb MD	2 yrs	12	4	Varies	None[1] B
North Carolina Baptist Hospital and Bowman Gray School of Medicine Winston Salem	Salem College†‡ Wake Forest College† Carson Newman College† Flora MacDonald College† Lenoir Rhyne College†	R W Prichard MD	3 yr	12	16	June	$100
NORTH DAKOTA							
St Alexius Hospital Bismarck	North Dakota Agricultural College†, University of North Dakota†‡	J W Larson MD R R Kling MD	[illegible] yrs	12	12	June Sept	None[1] B
St Luke's Hospital Fargo	Concordia College‡ Jamestown College† North Dakota State University†	T D Lemar MD	3 yrs	12	[illegible]	Varies	Univ B
Deaconess Hospital Grand Forks	University of North Dakota†	J D Cardy MD A K Saiki MD	3 yrs	12	10	June	Univ

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NORTH DAKOTA—Continued							
St Michael's Hospital, Grand Forks	University of North Dakota†‡	J D Cardy MD A K Saiki MD	3 yrs	12	10	June	Univ
St Joseph's Hospital Minot	Minot State Teachers College	G R Richardson, MD	3 yrs	12	3	Spring Fall	None B
Trinity Hospital, Minot	North Dakota Agricultural College†‡, University of North Dakota	P J Breslich MD	2 yrs	12	10	June	None
OHIO							
Akron City Hospital, Akron	Kent State University†‡ University of Akron†‡	L Catron MD	2 3 4 yrs	12	12	Varies	None¹
Akron General Hospital Akron*	Kent State University†‡ University of Akron†‡	G R Dochat, MD	2 yrs	12	6	July	None¹
Children's Hospital, Akron	University of Akron†‡ Kent State University†‡	M R Baker MD	2 yrs	12	4	June Sept	None¹
St Thomas Hospital Akron	University of Akron†‡ Kent State University†‡	G G Proskauer MD	2 yrs	12	6	Varies	None¹
Alliance City Hospital, Alliance	Mount Union College†‡	A F Hardy MD	2 yrs	12	8	Monthly	None¹
Barberton Citizens Hospital, Barberton	Akron University†‡	F F Hamilton MD	2 yrs	12	3	Varies	None¹
Aultman Hospital, Canton	Kent State University†‡ Mount Union College†‡	F B Queen MD	2 yrs	12	12	July	None¹
Mercy Hospital, Canton	Kent State University†‡	A Raftery MD	2 yrs	12	8	Varies	None²
Bethesda Hospital Cincinnati	University of Cincinnati†‡	J B Hamblet MD	2 yrs	12	3	Varies	None¹
Children's Hospital, Cincinnati	University of Cincinnati†‡	B H Landing, MD	2 yrs	12	4	Varies	$125¹
Christ Hospital, Cincinnati	University of Cincinnati†‡	P N Jolly MD	2 3 yrs	12	4	July	$125
Cincinnati General Hospital Cincinnati	University of Cincinnati†‡	E A Gall MD	3 yrs	12	6	July	Univ B
Good Samaritan Hospital Cincinnati	Mt St Joseph College†‡ Villa Madonna College†‡	I Gordon, MD	3 yrs	16	8	July	Univ ¹
Jewish Hospital Association and Medical Center, Cincinnati	University of Cincinnati†‡	P Wasserman MD	2 yrs	12	8	Quarterly	$125³ B
Our Lady of Mercy Hospital, Mariemont Cincinnati	Our Lady of Cincinnati College†‡	K L Stemmer MD	3 yrs	14	4	Varies	Univ ¹B
Frank E Bunts Educational Institute Cleveland Clinic, Cleveland	Baldwin Wallace College†‡ Kent State University†‡ Thiel College†‡ Colby Junior College†‡	J W King MD	3 yrs	12	12	Varies	None
Cleveland Metropolitan General Hospital Cleveland	Western Reserve University†‡ Kent State University†‡	T D Kinney MD	3 yrs	12	10	Varies	$100
Fairview Park Hospital Cleveland	Baldwin Wallace College†‡	F W Tillotson MD H F McCorkle MD	3 yrs	12	7	July	None¹
Huron Road Hospital Cleveland		J Goodsitt MD	2 yrs	12	8	Jan July	$50
Mount Sinai Hospital Cleveland	Western Reserve University†‡ Baldwin Wallace College†‡	H Goldblatt MD	2 yrs	12	8	Varies	$100
St Vincent Charity Hospital, Cleveland		J S Mackrell MD	3 yrs	12	6	July Sept	None¹
University Hospitals of Cleveland Cleveland	Western Reserve University†‡	J C Smith, MD	2 yrs	12	17	Varies	
Mount Carmel Hospital Columbus	Ohio University†‡ College of St Mary of the Springs†‡	H B Davidson, MD	2 yrs	12	17	July	None
University Hospital Columbus	Ohio State University†‡ Capital University†‡ Miami University†‡ Wittenberg University†‡, Wilmington College†‡	F von Haam MD	3 yrs	12	60	Fall	Univ
Good Samaritan Hospital Dayton	University of Dayton†‡ Mt St Joseph College†‡	J B McMillan MD	2 3 yrs	12	6	July Sept	None
Miami Valley Hospital, Dayton	University of Dayton†‡ Wittenberg University†‡ Western College†‡ Otterbein College†‡	M Oosting, MD	3 yrs	13	10	July	None B
St Elizabeth Hospital Dayton	University of Dayton†‡	W Abramson, MD	2 3 yrs	12	10	July	None
Elyria Memorial Hospital Elyria	Baldwin Wallace College†‡	R G Thomas MD	2 yrs	12	8	Oct	None
Mercy Hospital, Hamilton		K F Lande, MD	2 yrs	12	4	Quarterly	None¹
Lakewood Hospital Lakewood	Baldwin Wallace College†‡	O Fitzen, MD	2 yrs	12	3	Varies	None¹
St Rita's Hospital, Lima	Ohio Northern University†‡ Bowling Green State University†‡ Findlay College†‡ Bluffton College†‡	C L Blumstein MD D E Hughes MD	3 yrs	12	6	Varies	None¹
St Joseph Hospital, Lorain	Notre Dame College†‡	C Chesner MD	2 yrs	12	3	Varies	None¹
Mansfield General Hospital Mansfield	Ashland College†‡	B M Hathaway MD	3 yrs	12	3	Varies	None¹
Marietta Memorial Hospital, Marietta		D B Thornburgh MD R A McDougal MD	2 yrs	12	4	Sept	None
Mercy Hospital, Portsmouth	College of St Teresa†‡	T I Gohmann MD	2 yrs	12	3	June	None¹ B
Central Clinic and Hospital Salem*	Mount Union College†‡	W A Kolozsi MD	2 yrs	12	1	Varies	None¹
Mercy Hospital, Springfield	Our Lady of Cincinnati College†‡ Wittenberg University†‡	M P Hunter, MD	2 yrs	12	10	Varies	None
Springfield City Hospital, Springfield	Wittenberg College†‡ Central State College†‡	R E Wybel MD	2 yrs	12	6	June Sept	None
Ohio Valley Hospital, Steubenville	College of Steubenville†‡	C Goehring MD	3 yrs	12	4	Varies	None
Mercy Hospital Toledo	University of Toledo†‡ Mary Manse College†‡	F L Burns MD J B Rucker MD	3 yrs	12	9	Varies	None
Riverside Hospital Toledo*	University of Toledo†‡	D C Wilson MD	3 yrs	12	2	Feb Sept	None¹
St Charles Hospital, Toledo	University of Toledo†‡	W H Hartung, Jr, MD	3 yrs	12	4	June Sept	None¹
St Vincent's Hospital, Toledo	University of Toledo†‡ Mary Manse College†‡	M F Vidoli MD	3 yrs	12	[illegible]	Varies	None³
Toledo Hospital, Toledo	University of Toledo†‡ Bowling Green State University†‡	B Steinberg MD	3 yrs	12	6	Varies	None¹
Trumbull Memorial Hospital, Warren	Youngstown University†‡	R J Williams, MD	2 yrs	12	5	Varies	None³
St Elizabeth Hospital, Youngstown	Youngstown University†‡, Central State University†‡	B Taylor MD, J Tandatnick MD	2 yrs	12	12	Varies	None

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OHIO—Continued							
Youngstown Hospital Association Youngstown	Youngstown University† Kent State University†‡ Thiel College‡ Bowling Green State University*	A E Rappoport M D	2 yrs	12	15	Monthly	None¹
OKLAHOMA							
Valley View Hospital Ada	East Central State College* Oklahoma State University†‡ Baptist University†‡ Southwestern State College*	R U Northrip M D	2 yr	12	6	Varies	None B
St Mary Hospital Enid	Phillips University†‡ Northwestern State College* Southwestern State College‡ Oklahoma State University†	H T Russell M D	3 yrs	12	5	Feb July	None¹
Comanche County Memorial Hospital Lawton	Oklahoma Baptist University† Eastcentral State College* Southwestern State College† Oklahoma University†. Oklahoma College for Women‡	J F Thornton M D	2 yrs	12	2	Varies	None³ B
Central State Hospital Norman	University of Oklahoma†‡ Oklahoma Baptist University†‡ Southwestern State College‡ Oklahoma State University†	J P Dewar M D	3 yrs	12	3	Varies	None¹
Baptist Memorial Hospital Oklahoma City	University of Oklahoma†	D F Hunter Jr M D	3 yrs	12	6	Jan July	None¹
Mercy Hospital Oklahoma City	Xavier University†‡ Southwestern State College†‡ Oklahoma College for Women†* Central State College† University of Oklahoma†. Oklahoma State University† Oklahoma City University†. Northwestern State College†.	H A Stout M D	2 yrs	12	10	Varies	None¹ B
St Anthony Hospital Oklahoma City	University of Oklahoma† Oklahoma State University†‡ Central State College†. Southwestern State College†. Oklahoma City University†.	W T Snoddy M D	3-4 yrs	12	8	Varies	None¹
University of Oklahoma Medical Center Oklahoma City	University of Oklahoma†. Oklahoma Baptist University† Southwestern State College†* Langston University†‡ Oklahoma State University†‡ Phillips University†*	A K Lee M D	3 yrs	12	12	July	None¹
Wesley Hospital Oklahoma City	Southwestern State College* Oklahoma State University† University of Oklahoma†‡ Oklahoma Baptist University†‡ Oklahoma College for Women†‡	W F Keller M D	3 yrs	12	5	Spr Fall	None
Hillcrest Medical Center Tulsa	University of Tulsa†‡ Oklahoma State University†‡ Northeastern State College*	I Lowbeer M D	3 yr	12	6	Spr Fall	None¹
St John's Hospital Tulsa	University of Tulsa†‡ Oklahoma State University†‡ Oklahoma City University†*	E E Palik M D	3 yrs	12	12	Varies	None¹
OREGON							
Sacred Heart General Hospital Eugene	Lewis and Clark College†.	F D Furrer M D	2 yr	12	4	Varies	None¹
Emanuel Hospital Portland	Lewis and Clark College†. Pacific Lutheran College†‡	A D Sneeden M D	2 yrs	12	10	Sept	None
Good Samaritan Hospital Portland	Lewis and Clark College†	M W Heinemann Jr M D	3 yrs	12	12	Varies	None B
Portland Sanitarium and Hospital Portland	Walla Walla College†‡	W C Hunter M D A Oyamada M D	2 3 yrs	12	5	Varies	None
St Vincent Hospital Portland	Marylhurst College†* University of Portland†‡	J E Nohlgren M D	3 yr	12	10	July	None¹
University of Oregon Medical School Hospital and Clinics Portland	University of Oregon†‡	R D Grondahl M D	3 yrs	12	50	Sept	Univ
PENNSYLVANIA							
Abington Memorial Hospital Abington	Beaver College† Marywood College†‡ Colby Junior College†‡	J W Finan M D P J Cherney M D	2 yrs	12	12	July	None¹
Allentown Hospital Allentown	Cedar Crest College†‡ Moravian College†	G Selin M D	2 yrs	12	9	Feb July	None¹
Sacred Heart Hospital Allentown	Moravian College†‡ Cedar Crest College†‡	D E Stader M D	3 yrs	12	10	July	None¹
Altoona Hospital Altoona	St Francis College†* Elizabethtown College†‡	G J Heid Jr M D	2 yrs	15	2	June Sept	None¹
St Luke's Hospital Bethlehem	Moravian College†.	E J Benz M D	2 yrs	12	4	July	None¹
Lower Bucks County Hospital Bristol		J J McGraw Jr M D	2 yrs	12	4	July Sept	None¹
Butler County Memorial Hospital Butler		R M Weaver M D	3 yrs	12	3	June Sept	None¹
Chambersburg Hospital Chambersburg		W E B Hall M D	2 yrs	12	1	Varies	None¹
Chester Hospital Chester		G B Sickel M D	2 yrs	12	4	Varies	None
Geisinger Memorial Hospital and Foss Clinic Danville		J C Sieracki M D	2 yrs	12	7	June Sept	None¹
Thomas M Fitzgerald Mercy Hospital Darby	Gwynedd Mercy Junior College†	D B Stein Jr M D	2 yrs	18-24	8	Sept	$50 yr

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PENNSYLVANIA—Continued							
St Vincent Hospital, Erie	Villa Maria College†‡ Mercyhurst College†‡	R B Eisenberg M D	3 yrs	12	10	Sept	$100
Harrisburg Hospital, Harrisburg	Lebanon Valley College†‡ Elizabethtown College†‡	I W Brason M D	2 yrs	12	10	Feb Sept	None[1]
Harrisburg Polyclinic Hospital Harrisburg*		J S Forrester M D	2 yrs	12	6	July Sept	None[1]
Hazleton State Hospital Hazleton	Pennsylvania State University	J Foldes, M D	2 yrs	15	6	Varies	None[1]
St Joseph Hospital, Hazleton*		J Foldes M D	3 yrs	12	5	July	None[1]
Conemaugh Valley Memorial Hospital Johnstown	St Francis College†‡	W W Ayres M D	2 yrs	12	10	July Sept	None[1]
Mercy Hospital Johnstown	St Francis College†‡ Mt Aloysius College†	A M Benshoff M D	2 yrs	12	8	July Sept	None[1] B
Lancaster General Hospital Lancaster	Elizabethtown College†‡	W M O'Donnell M D	2 yrs	12	10	July	None[1]
St Joseph's Hospital Lancaster	St Francis College†‡ Elizabethtown College†‡	H G Shaub M D	2 yrs	12	6	Varies	None[1]
Latrobe Hospital Latrobe		W W Jetter M D	2 yrs	12	2	June	None[1]
Allegheny Valley Hospital Natrona Heights		S T C Miller, M D	3 yrs	12 18	8	July	None[1]
Albert Einstein Medical Center, Philadelphia		H Brody, M D D Meranze, M D	2 yrs	12	12	Sept	$50
Bryn Mawr Hospital Philadelphia		M Strumia M D	2 yrs	15	10	Quarterly	None
Germantown Dispensary and Hospital, Philadelphia*		F Fite M D	2 yrs	12	6	Summer	None[1]
Hahnemann Medical College and Hospital Philadelphia	Hahnemann Medical College†‡	R Maughlin, M D	2 yrs	21	24	Sept	$130 B
Jefferson Medical College Hospital Philadelphia*		P A Herbut M D	2 yrs	12	15	Sept	$100
Lankenau Hospital, Philadelphia	Drexel Institute of Technology†‡	C F Brown, M D	3 yrs	12	8	June Sept	$100 B
Mercy Douglass Hospital Philadelphia		W P Belk M D	3 yrs	21	2	Monthly	$75 yr
Misericordia Hospital, Philadelphia*	Gwynedd Mercy Junior College	H I Marx M D	2 yrs	12	12	July	None B
Nazareth Hospital, Philadelphia*	Holy Family College†‡	J F Ciccone M D	3 yrs	12	6	July	$100[1] B
Pennsylvania Hospital Philadelphia		A R Crane, M D	2 yrs	12	10	Monthly	$100
Philadelphia General Hospital Philadelphia		W J Ehrich, M D H Schwarz M D	2 yrs	12	16	Quarterly	None
Presbyterian Hospital, Philadelphia	Drexel Institute of Technology†‡	R P Custer M D	2 yrs	12 18	10	Mar Sept	None[1]
St Agnes Hospital, Philadelphia		W E Delaney III M D	2 yrs	12 18	10	Varies	$50[1]
Temple University, Philadelphia	Temple University†‡	E F Aegerter M D	2 yrs	24	30	Aug	Univ
University of Pennsylvania School of Allied Medical Professions Philadelphia	University of Pennsylvania†‡	R F Norris M D	2 yrs	12	12	Feb June	Univ B
Allegheny General Hospital Pittsburgh		R C Grauer M D	2 yrs	12	12	June Sept	None[1]
Mercy Hospital Pittsburgh	Mount Mercy College†‡	M M Bracken, M D	3 yrs	12	12	Varies	$100
Montefiore Hospital, Pittsburgh	Mount Aloysius Junior College†‡ St Francis College†‡	H Mendelow M D	2 yrs	12	12	June Sept	None
St Francis General Hospital and Rehabilitation Institute, Pittsburgh*		K C Hamilton M D	3 yrs	12	10	Fall	None
Western Pennsylvania Hospital Pittsburgh	Albright College†‡ Cedar Crest College†‡ Lebanon Valley College†‡ St Francis College†‡ Waynesburg College†‡ West Liberty State College†‡	R G McManus M D	2 yrs	12	15	Sept	None B
Pottsville Hospital, Pottsville		R I Hobbs M D	3 yrs	12	4	Varies	None[1]
St Joseph's Hospital Reading		G P Desjardins M D J G ChenSee M D	2 yrs	12	6	June	None[1]
Rochester General Hospital Rochester	Geneva College‡	J W McCreary M D J J Moyer M D	2 yrs	12	6	Jan July	None[1]
Robert Packer Hospital Sayre	Marywood College‡ Elmira College‡	C H DeWan M D	2 yrs	12	6	June	None[1]
Moses Taylor Hospital, Scranton		C L Mattas, M D	3 yrs	12	4	June	None
Scranton State Hospital, Scranton		J J O Connor, Jr M D	2 yrs	12	6	June	None
Sewickley Valley Hospital, Sewickley		C M Miller M D	2 yrs	12	4	Varies	None
Sharon General Hospital, Sharon	Thiel College†‡	F J Raisch M D	2 3 yrs	12	6	July	None
Washington Hospital, Washington*		H Quittner, M D	3 yrs	12	2	Sept	None[1]
Reading Hospital, West Reading	Albright College‡	W P Jennings M D	2 yrs	12	4	July	None[1]
Wilkes Barre General Hospital Wilkes Barre	Wilkes College†‡	C E Rodriguez M D	3 yrs	12	3	Spr Fall	None
Divine Providence Hospital Williamsport	Lycoming College‡	C A Bologna M D	3 yrs	12	3	July	None[1] B
Williamsport Hospital, Williamsport	Lycoming College†‡	M G Colvin M D M J Pophal M D	3 yrs	12	6	July Sept	None[1]
York Hospital York		T J Burkart M D J Gochoco M D	2 yrs	12	8	July	None[1]
RHODE ISLAND							
State Hospital for Mental Diseases Howard		I Meyer M D	4 yrs	12	2	Varies	None
Memorial Hospital Pawtucket	University of Rhode Island†‡	G P Papaio M D	3 yrs	12	4	June Sept	None[1]
Rhode Island Hospital Providence		H Fanger M D	2 4 yrs	12	3	July Sept	None[1]
St Joseph's Hospital, Providence	Stonehill College	S R Allegra M D	2 yrs	12	6	July	None[1]
SOUTH CAROLINA							
Anderson Memorial Hospital Anderson*		T C Nation M D	2 yrs	12 18	6	Varies	None[1]
Medical College of South Carolina Charleston	College of Charleston†‡	D W Ellis, M D	3 yrs	15	12	Varies	None B
McLeod Infirmary, Florence*		D J Greiner, M D	2 yrs	12	4	Jan July	None[1]
Greenville General Hospital, Greenville		F A Dreskin, M D	2 yrs	12	9	Varies	None
Self Memorial Hospital, Greenwood	Lander College†‡	H W May M D	3 yrs	12	6	June Sept	None[1]
Spartanburg General Hospital, Spartanburg		M F Patton M D	2 yrs	12	10	Varies	None

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
SOUTH DAKOTA							
St Luke Hospital Aberdeen	Northern State Teachers College†,	R K Rank M D	2 yrs	12	8	June Sept	$40 B
St John's Hospital Huron	Huron College†,	R I Carefoot M D	3 yrs	12	2	Monthly	None
St Joseph Hospital Mitchell		J J Voe M D	2 yrs	12	2	Jan July	None
St John McNamara Hospital Rapid City		W A Gelb M D	2 yrs	12	8	Quarterly	None¹
McKennan Hospital Sioux Falls	University of South Dakota†,	A K Myrabo M D T R Anderson M D	2 yrs	12	8	July	None
Sioux Valley Hospital Sioux Falls	State University of South Dakota†‡ South Dakota State College†‡ Sioux Falls College†‡	C B Mitchell M D	3 yrs	12	16	July Sept	None
Sacred Heart Hospital Yankton	State University of South Dakota† Yankton College†*	I I Tidd M D	2 yrs	12	8	Feb June	None B
TENNESSEE							
Barone's Erlanger Hospital Chattanooga	University of Chattanooga†, Tennessee Wesleyan College†*	J W Adams Jr M D	3 yrs	12	12	Varies	None
Memorial Hospital Chattanooga	University of Chattanooga†* Siena College†, Tennessee Wesleyan College†,	B A Elrod M D	2 yrs	12	8	Monthly	None¹
Jackson Madison County General Hospital Jackson	Lambuth College†	C K Jones M D	2 yrs	18	6	Jan June	None
Holston Valley Community Hospital Kingsport	East Tennessee State College†	W Harrison M D	2 yrs	12	4	July	None
East Tennessee Baptist Hospital Knoxville	Carson Newman College†,	R J Leffler M D	2 yrs	12	4	Varies	None¹
St Mary's Memorial Hospital Knoxville	Lincoln Memorial University†‡ Maryville College‡	G S Mahon M D	2 yrs	12	4	Oct	None
Madison Sanitarium and Hospital Madison	Madison College‡	C F Kendall	2 yrs	12	6	Quarterly	Univ ¹
Blount Memorial Hospital Maryville	Maryville College†	F P Kintner M D F M Kelman M D	2 yrs	12	4	Varies	None
Baptist Memorial Hospital Memphis		M I Trumbull M D	2 yrs	12	10	Sept	None¹ B
Methodist Hospital Memphis		C H Steffee M D	2 yrs	13	20	Monthly	None¹
St Joseph Hospital Memphis	Siena College‡	L C Pileto Jr M D	2 yrs	12	6	Sept	None B
University of Tennessee College of Medicine Memphis	University of Tennessee†	D H Sprunt M D	2½ yrs	15	34	Jan July	$278 B
Hubbard Hospital of Meharry Medical College Nashville	Tennessee A & I State University†‡	C D Holloway M D	2 yrs	22	15	Sept	$35 Qtr
Mid State Baptist Hospital Nashville	Belmont College‡ David Lipscomb College†,	F C Womack Jr M D	2 yrs	12	6	July Sept	None¹
Nashville General Hospital Nashville		W A DeMonbreun M D	2 yrs	12	5	Varies	None
St Thomas Hospital Nashville	Tennessee Polytechnic Institute†	D K Cotwald M D T C Delvaux Jr M D	2 yrs	12	6	Quarterly	None
Veterans Administration Hospital Nashville		N Ende M D	2 yrs	12	4	Monthly	None
TEXAS							
Hendrick Memorial Hospital Abilene	Abilene Christian College† Hardin Simmons University†* McMurry College†,	J F Williams M D B B Trotter M D	2 yr	13	12	Monthly	None¹
Northwest Texas Hospital Amarillo	Southwestern State College‡	J V Denko M D	2 yrs	12	2	Sept	None
Austin State Hospital Austin	University of Texas†‡ Southwestern University†‡ North Texas State College†‡	S W Bohls M D	3 yrs	12	7	June Sept	None¹
Brackenridge Hospital Austin	University of Texas†‡	D M Queen M D	4 yrs	12	12	Sept	None¹
Baptist Hospital of Southeast Texas Beaumont	2	T I Smith M D	2 yrs	12	6	June Sept	None¹
Hotel Dieu Beaumont	Lamar State College‡	H R Wilcox M D	2 yrs	12	4	Varies	None
Memorial Hospital Corpus Christi		T Pilcher M D J H Sisson M.D	2 yrs	12	3	July	None¹
Spohn Hospital Corpus Christi	Texas College of Arts & Industries†‡	J G Pasternack M D	2-3 yrs	12	4	June Sept	$75¹
Baylor University Hospital Dallas	Baylor University†‡ North Texas State College†‡ East Texas Baptist College†,	C J Race M D	2 yr	13	32	Varies	None¹
Parkland Memorial Hospital Dallas	Texas Woman's University†	C T Ashworth M D	2 yrs	12	12	Varies	None
St Paul Hospital Dallas	St Mary's University†‡ University of Dallas†‡ North Texas State College‡	T I Goforth M D	4 yrs	12	10	Varies	None¹
Hotel Dieu Hospital El Paso		M S Hart M D	2 yrs	12	6	Varies	None
Harris Hospital Fort Worth	Texas Christian University‡	C D Fitzwilliam M D	3 yrs	12	7	Varies	None¹
St Joseph Hospital Fort Worth	University of Dallas†‡ Incarnate Word College†‡ Texas Wesleyan College†‡	O J Wollenman Jr M D	2 yrs	12	5	Varies	None¹
Terrell's Laboratories Fort Worth	North Texas State College‡ Texas Wesleyan College†‡	T C Terrell M D	2 yrs	13	12	Varies	None¹
St Mary's Infirmary Galveston	University of Texas Medical Branch	G W Thomas M D	3 yrs	12	3	Varies	None
University of Texas-John Sealy Hospital Galveston	North Texas State College†* University of Houston†‡ Stephen F Austin State College†‡ Sam Houston State Teachers College†‡ Texas Lutheran College†‡ University of Texas†‡	F E Baird M D	2 yrs	12	24	July Oct	$180 B
Valley Baptist Hospital Harlingen	Texas College of Arts & Industries†‡ Pan American College†	D W Flory M D	2 yrs	12	4	Monthly	None
Hermann Hospital Houston	Lamar State College†‡ University of Texas†‡	W G Brown M D	2 yrs	12	15	Sept	$50¹
Jefferson Davis Hospital Houston	Texas Southern University†‡	J Vaughn M D	2 yrs	15	8	Monthly	None
Memorial Baptist Hospital Houston*		F Leidler M D	2 yrs	12	5	June Sept	None¹
Methodist Hospital Houston		J P Abbott M D	2 yrs	12½	12	Monthly	None¹

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
TEXAS—Continued							
St Joseph's Hospital, Houston	University of St Thomas†‡, Sacred Heart Dominican College†‡	P M Marcuse, M D	2 yrs	12	9	Varies	None[1]
University of Texas M D Anderson *Hospital and Tumor Institute* Houston*	University of Texas†‡	W O Russell, M D	3 yrs	12	2	July	None[1]
Methodist Hospital, Lubbock*		R A Keffler, M D	2 yrs	12	,	Varies	None
Midland Memorial Hospital, Midland	Mary Hardin-Baylor College†‡	M F Madsen M D	2 yrs	12	6	Varies	None[1]
St Mary's Hospital, Port Arthur	Lamar State College†‡ Southwestern Louisiana Institute†‡ Northwestern State College†‡	S M Wallace, M D	2 yrs	12	6	Jan July	None[1]
Shannon West Texas Memorial Hospital, San Angelo	Sul Ross State College†‡ Mary Hardin-Baylor College†‡	R F Trotter M D	2 yrs	12	7	Monthly	None[1]
Baptist Memorial Hospital, San Antonio	Trinity University†‡, Southwestern University†‡	A O Severance M D H A Van Auken M D	2 yrs	18	16	Monthly	None[1]
Nix Hospital, San Antonio*	Our Lady of the Lake College†‡	D A Todd, M D	2 yrs	12	6	Varies	None[1]
Robert B Green Memorial Hospital, San Antonio	San Antonio College†‡ Trinity University†‡	D L Galindo M D	2 yrs	12 18	8	Varies	None[1]
Santa Rosa Hospital, San Antonio	*Incarnate Word College†‡*	N H Jacob, M D	2 yrs	12	12	June Sept	Univ[1]
U S Air Force Hospital, (Lackland) San Antonio		Lt Col D Auld (MC)	3 yrs	12	10	Varies	None
Wadley Hospital, Texarkana	*Texarkana College*	*R H Chappell, M D*, J L Duncan M D	2 yrs	12	4	Quarterly	None
UTAH							
St Benedict's Hospital, Ogden	University of Utah†‡ Utah State University†‡	E E Pautler, M D	3 yrs	12	4	Varies	None
Thomas D Dee Memorial Hospital, Ogden	Utah State University†‡ Brigham Young University†‡, University of Utah†‡	W A Bennett, M D H G Hicks, M D	2 yrs	12	6	Varies	None[1]
Utah Valley Hospital, Provo	Brigham Young University†‡	W H LeCheminant M D	3 yrs	12	5	July	None[1]
Dr Groves Latter Day Saints Hospital Salt Lake City	University of Utah†‡ Utah State University†‡ Brigham Young *University†‡*	J H Carlquist, M D	3 yrs	12	8	July Sept	None[1]
Holy Cross Hospital, Salt Lake City	University of Utah†‡	C D Fullmer, M D	3 yrs	12	8	July	None[1]
St Mark's Hospital, Salt Lake City	University of Utah†‡, Brigham Young University†‡ Westminster College†‡	A P Crano, M D	2 3 yrs	12	3	Varies	None[1]
Salt Lake County General Hospital, Salt Lake City	University of Utah†‡	W H Carnes, M D	3 yrs	12	4	July	Univ[1]
VERMONT							
DeGoesbriand *Memorial Hospital*, Burlington*	Trinity College†‡	F Stark, M D	3 yrs	12	4	June	Univ
University of Vermont College of Medicine, Burlington	University of Vermont†‡	R W Coon M D J V Crowley M D	3 yrs	12	20	Sept	Univ
VIRGINIA							
University of Virginia Hospital, Charlottesville*	Mary Washington College†‡ Madison College†‡ Longwood *College†‡*	O B *Bobbitt, M D*	3 yrs	12	8	Sept	$100
Memorial Hospital Danville*		L W Powell, M D	2 yrs	12	6	Sept	None[1]
Lynchburg General Hospital Lynchburg	Lynchburg College†‡	S M Bouton Jr M D	3 yrs	12 18	6	June Sept	None
Mary Immaculate Hospital, Newport News	College of William and Mary†‡	M B Beecroft M D	2 yrs	12	2	June Sept	None[1]
Riverside Hospital, Newport News		M T Sherrill, M D	3 yrs	12	5	Varies	None[1]
DePaul Hospital, Norfolk*	College of William and Mary†‡	A Strauss, M D R J Fauleconer M D	2 yrs	12	10	Sept	None[1]
Norfolk General Hospital, Norfolk	College of William and Mary†‡	R Shuman M D, F D Levy, M D	2 yrs	12	10	June Sept	$100[5] B
Medical College of *Virginia Richmond**		H G Kupfer M D	2 yrs	12	50	Mar Sept	$166
Richmond Memorial Hospital, Richmond	Richmond Professional Institute†‡	W M Monroe M D	3 yrs	12	4	June	None
Jefferson Hospital, Roanoke*	Roanoke College†‡	D Leavitt M D	2 yrs	12	2	Varies	None[1]
Lewis Gale Hospital, Roanoke	Roanoke College	A V Torre, M D	2 yrs	12	2	July	None[1]
Roanoke Memorial Hospital, Roanoke	Roanoke College†‡	J C Gale, M D	2 yrs	12	8	Varies	None[1]
King's Daughters' Hospital, Staunton*	Mary Baldwin College†‡	K F Menk M D	3 yrs	12	2	June Sept	$100
WASHINGTON							
Children's Orthopedic Hospital, Seattle	Seattle University†‡ Whitman College†‡ Seattle Pacific College†‡ Washington State College†‡, University of Washington†‡	S A Creighton M D	3 yrs	12	10	*Quarterly*	None[1]
King County Hospital Seattle	Marylhurst College†‡	J I Schuldberg, M D	2 yrs	12½	10	Summer	None[1]
Mason Clinic Virginia Mason Hospital, Seattle*	Seattle University†‡ Whitworth College†‡, Washington State College†‡	H Tesluk M D	3 yrs	12	,	Varies	None[1]
Providence Hospital, Seattle*		D G Mason, M D	2 yrs	12	6	July Oct	None[1]
Swedish Hospital, Seattle*	Washington State University†‡, Pacific Lutheran College†‡ Seattle University†‡, Seattle Pacific College†‡	P K Lund, M D	3 4 yrs	12	8	July	None[1]
University of Washington School of Medicine, Seattle	University of Washington†‡	N K Mottet, M D	3 yrs	18	14	June Oct	Univ[1] B
Deaconess Hospital, Spokane	University of Idaho†‡, Whitworth College†‡	T F Ludden M D	2 yrs	12	6	Varies	None[1]

Name and Location of School	College Affiliation	Pathologist in Charge	Minimum Prerequisite College	Length of Training in Months	Student Capacity	Classes Begin	Tuition
WASHINGTON—Continued							
Sacred Heart Hospital Spokane	Gonzaga University†‡	J F Hill MD	2 yr	12	12	July Sept	None
St Luke's Hospital Spokane	[4]	O O Christianson MD	2 yrs	12	16	Varies	None[1]
St Joseph's Hospital Tacoma		C R McColl MD	2 yrs	12	4	Spr Fall	None[1]
Tacoma General Hospital Tacoma	University of Puget Sound†* Pacific Lutheran College†	C P Larson MD	2 yrs	12	9	Varies	None
WEST VIRGINIA							
Beckley Memorial Hospital Beckley	Concord College†* Morehead State College†‡	W A Laqueur MD	2 yr	12	10	June Sept	None[1]
Bluefield Sanitarium Bluefield		D F Bell Jr MD	2 yrs	12	10	Sept	None[1]
Memorial Hospital Charleston	Morris Harvey College†	C B Swoyer MD	2 yrs	12	3	July Sept	None[1]
St Mary's Hospital Clarksburg	Salem College† West Virginia Wesleyan College† Xavier University†	H Fischer MD	2 yrs	12	8	July Sept	None B
Fairmont General Hospital Fairmont	West Virginia University†*	W A Ehrgott MD	3 yrs	12	3	July	None
Cabell Huntington Hospital Huntington	Marshall College†*	S Werthammer MD	2 yrs	12	8	Sept	None
West Virginia University School of Medicine Morgantown		M I Hobbs MD	3 yrs	12	24	Sept	Univ B
Camden Clark Memorial Hospital Parkersburg		C W Thacker MD	2 yrs	12	6	Varies	None
Myers Clinic Broaddus Hospital Philippi	Alderson Broaddus College†*	F F Myers MD	3 yrs	20	12	Sept	$40
Ohio Valley General Hospital Wheeling	West Liberty State College†‡	H G Little MD R O Bell Jr MD	2 yrs	12	2	July	None
WISCONSIN							
Beloit Hospital Beloit	Beloit College†	J W Kleppe MD	3 yrs	12	4	June	None[1]
Sacred Heart Hospital Eau Claire	Wisconsin State College†*	R J Fink MD	3 yrs	12	6	July	None[1]
St Agnes Hospital Fond du Lac	St Norbert College† Wisconsin State College†*	R W Steube MD	3 yrs	12	12	June	None
St Francis Hospital LaCrosse	Viterbo College†* Wisconsin State College†* Marquette University†*	P C Dietz MD	2 yrs	12	6	Sept	None B
Madison General Hospital Madison	LaCrosse State College†‡ Stevens Point State College†* River Falls State College†‡ Superior State College†‡	P C Piper MD	3 yrs	12	8	Sept	None
St Mary's Hospital Madison*	Edgewood College of the Sacred Heart†‡ Mount Mary College†‡ College of St Teresa†* Briar Cliff College†	B A Brucker MD	3 4 yrs	12	10	Sept	None B
University Hospital Madison	University of Wisconsin†‡	F C Larson MD	3 yrs	12	26	Sept	Univ
St Joseph's Hospital Marshfield	Central State College†‡	F J Glassy MD C I Bowerman MD	2 yrs	12	5	July	None
Columbia Hospital Milwaukee	Marquette University†	G Ritchie MD	2 yrs	12	6	Sept	None[1]
Evangelical Deaconess Hospital Milwaukee*	Marquette University†*	R S Haukohl MD	3 yrs	12	7	Varies	None
Milwaukee County Hospital Milwaukee	Marquette University†	P Kimmelstiel MD	3 yrs	12	8	July	None
Milwaukee Hospital Milwaukee	Marquette University†‡	F A Birge MD	2 yrs	12	6	July	None[1]
Misericordia Hospital Milwaukee		L J Van Hecke MD	2 yrs	12	3	Feb July	None[1]
Mount Sinai Hospital Milwaukee	Carroll College†‡	N Enzer MD	2 yrs	12	4	Sept	None[1]
St Joseph's Hospital Milwaukee	Marquette University†	C H Altshuler MD	2 yrs	12	8	Sept	None[1]
St Luke's Hospital Milwaukee	Marquette University†‡ Alverno College†	B E Clarke MD	3 yr	12	10	Varies	None[1]
St Mary's Hospital Milwaukee	Marquette University† Alverno College†*	S B Pessin MD	3 yrs	12	6	Varies	None[3]
Mercy Hospital Oshkosh	Oshkosh State College†‡ St Norbert's College†‡	H M Hillenbrand MD	2 yrs	12	3	Sept	None B
St Luke's Memorial Hospital Racine		F S Olson MD	3 yrs	12	6	Varies	None[1]
St Mary's Hospital Racine	Marquette University†*	M Schuster MD	2 yrs	12	3	Varies	None[1]
St Michael's Hospital Stevens Point	Central State College†*	H I Grinvalsky MD	2 3 yrs	12	4	July	None
Waukesha Memorial Hospital Waukesha	Carroll College†*	R L Kascht MD C E Elson MD	3 yrs	12	3	July	None[1]
St Mary's Hospital Wausau	Wisconsin State College†‡ College of St Teresa†*	O R Kelley MD	2 yrs	12	6	Quarterly	None[1] B
Veterans Administration Center Wood	Marquette University†‡	R M Maynard MD	3 yr	12	6	Aug	None
WYOMING							
DePaul Hospital Cheyenne	St Mary's College‡	H Y Lumargan MD	2 yrs	12	2	Varies	None[1]
Richardson Memorial Hospital Cheyenne	University of Wyoming†*	S S Zuckerman MD	2 yr	12	10	Varies	Univ
CANAL ZONE							
Gorgas Hospital Ancon	Canal Zone Junior College†	H Mondragon MD	2 yrs	12	8	Jan July	None[1]
PUERTO RICO							
Department of Health Commonwealth of Puerto Rico Rio Piedras		O Costa Mandry MD	3 yrs	12	8	Aug	None[3]
University of Puerto Rico School of Medicine School of Tropical Medicine San Juan	University of Puerto Rico†	W A Cervoni MD	4 yr	12	25	Aug	$150 B

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* Only female students admitted

† College credit received during training

‡ Degree given after completion of combined course

[1] Students are paid a stipend

[2] College credit and degree allowed by each of the following affiliations Lamar State College Abilene Christian College University of Corpus Christi Hardin Simmons University Howard Payne College North Texas State College Stephen F Austin State College Texas College of Arts and Industries Texas Lutheran College Louisiana College Southwestern Louisiana Institute Ouachita Baptist College Oklahoma College for Women Southwestern State College McNeese State College

[3] Scholarship available

[4] College credit and degree allowed by each of the following affiliations University of Idaho Gonzaga University Whitworth College Holy Names College University of Alaska Eastern Washington College of Education Washington State University Whitman College

Univ University charges tuition fee

B Breakage fee charged

The Board of Schools of Medical Technology has encouraged the development of more approved schools of medical technology thus creating a greater interest in the profession and offering greater opportunities for medical technologists in the field of medical technology education. Degree programs with colleges have been encouraged so that today a majority of graduate medical technologists also have academic degrees.

The next several years will show continued progress in the field of laboratory medicine, necessitating constant reevaluation and planning in the education of medical technologists.

Melvin Oosting, M.D., Chairman
Board of Schools of Medical Technology
Miami Valley Hospital
Dayton 9, Ohio

Statistical Analysis.—As of June 30, 1960 there were 734 approved Schools of Medical Technology, or an increase of 4.7% over the 702 schools approved in 1959. A total enrollment of 3,944 students represented a sharp increase of 23% over last year. The number of graduates in 1959 was 2,573 or an increase of 10% over 1958. With a student capacity in the 734 schools of 5,563, there was an occupancy rate of 71% as compared with 60% for a year ago. This increase of 11% is significant, particularly in view of the increase of 32 newly approved schools.

Presently, 237 schools (32%) require three years of prechnical college education, this number is almost double that of last year. Thirty-eight, or 5% of the programs require four years of college or a baccalaureate degree for admission. Sixty-three per cent, or 459, of the approved training programs base admission on two years of college, a decrease of 14% from 1958. This number will decrease each year until 1962 as the revised essentials of an approved school are implemented.

In 1959, a total of 528 hospital schools had college or university affiliations compared with 503 in 1958. Such affiliations are strongly encouraged since they stimulate the development of well-organized training programs suitably integrated with the college curriculum and, of considerable importance, assist in the recruitment of students. If properly integrated, a degree is available upon completion of three years of college education followed by one year of hospital training in 507 (69%) of the 734 approved schools. There should be regularly scheduled meetings of an advisory or coordinating committee comprised of representatives from each component of the faculty.

The minimal duration of the hospital course acceptable for approval is 12 months. Ninety-one per cent, or 671 schools, offer a course of 12 months duration, the remaining 9% of the programs vary from 13 to 24 months in length. Tuition is required by 125 schools (17%). Students receive a stipend in 450, or 61%, of the schools.

Interested high school students should apply to accredited colleges and universities of their choice, those students in college or with collegiate backgrounds should apply to the pathologist-director of the hospital laboratory school of their choice. The list of approved schools of medical technology is given below.

The Essentials of an Approved School of Medical Technology establish minimal standards of training and serve as the basis for accrediting schools of medical technology. The Essentials can be found following the list of approved schools. Application for accreditation of a school should be made to the Council on Medical Education and Hospitals of the American Medical Association. The proper forms will be supplied for this purpose on request and are to be completed by the director of the laboratory requesting approval. Inquiries regarding the registration of qualified medical technologists should be addressed to the Board of Registry of Medical Technologists, P. O. Box 44, Muncie, Ind.

Essentials of an Acceptable School of Medical Technology

Prepared by the Council on Medical Education and Hospitals
of the American Medical Association
with the cooperation of the
Board of Schools of Medical Technology and the
Board of Registry of Medical Technologists of the
American Society of Clinical Pathologists, and the
American Society of Medical Technologists
Revised to December 3, 1959

Preamble

Three organizations are primarily concerned with the training of medical technologists, the Council on Medical Education and Hospitals of the American Medical Association, the American Society of Clinical Pathologists, and the American Society of Medical Technologists. Two boards of the American Society of Clinical Pathologists represent this Society. The Board of Schools of Medical Technology is primarily concerned with the evaluation and survey of schools of medical technology, acting in an advisory capacity to the Council, assisting also in the maintenance of high standards of education and in the development of new schools of medical technology. The Board of Registry of Medical Technologists investigates and certifies the competency of the technologists.

The Council, with the cooperation of the Board of Schools of Medical Technology, the Board of Registry of Medical Technologists, and the American Society of Medical Technologists, has established the following standards for this type of training for the information of schools, physicians, hospitals, prospective students, and others and for the protection of the public.

Technologists are being trained in these schools to work under the direction of qualified physicians and not as independent practitioners.

I Administration

1 Acceptable schools for training medical technologists may be conducted by approved medical schools, hospitals, or other acceptable laboratories suitably organized in accordance with present educational standards

2 All training of technologists shall be under *competent medical control*

3 Resources for continued operation of the school should be insured through regular budgets, gifts, or endowment, but not entirely through students' fees Experience has shown that commercial schools operated for profit frequently do not adhere to proper ethical and educational standards and therefore are not acceptable

II Organization

4 Adequate space, light and modern equipment should be provided in the laboratory department A library containing up-to-date references, texts, and scientific periodicals pertaining to clinical laboratory work and pathology should be maintained, or to be readily accessible to the institution

5 Satisfactory record systems should be provided for all work carried on in the department Monthly and annual classifications of the work of the department should be prepared

6 Transcripts of college credits and other credentials must be available To insure appropriate subsequent registration it is essential that evaluation of entrance credits be obtained from the Board of Registry of Medical Technologists An acceptable school keeps records of each student's attendance and grades, and it is also recommended that the type of tests performed be recorded In addition the school has a synopsis of the complete curriculum on file, a copy of which is submitted to the Council on Medical Education and Hospitals This curriculum should include the rotation of assignments, the outline of the instruction supplied by the laboratory and a list of the prepared specimens which are used to augment the experience of the student

7 At least two or more students should be enrolled in each class

III Faculty

8 The school should have a competent teaching staff The director must be a graduate in medicine who is certified in clinical pathology by the American Board of Pathology or who has had training and experience in clinical pathology acceptable to the Council He shall take part in and be responsible for the actual conduct of the training course He shall be in daily attendance for sufficient time to supervise properly the laboratory work and teaching

9 In laboratory practice the enrollment may not exceed two students to each member of the teaching staff The staff must include not less than one instructor whose duties include supervising the teaching program and who possesses a Bachelor's degree, is a registered medical technologist (ASCP) and who has had three years' experience or its equivalent This is in addition to the laboratory director In order to be considered as an instructor, a technologist should be a registered medical technologist (ASCP) and should preferably have at least one year of experience or its equivalent Members of the hospital staff or visiting instructors must have regular assignments that cover a complete course prescribed in these Essentials

IV Prerequisites for Admission

10 In order to conform to Board of Registry of Medical Technologists requirements for admission to examination, the following admission requirements should be fulfilled prior to being accepted in an approved school Two years, 90 quarter hours, or 60 semester hours of college work in a college or university accredited by a recognized standardizing association During the two years the following courses must be taken (1) 18 quarter hours or 12 semester hours of biology which may include general biology, bacteriology, parasitology, physiology, anatomy, histology, embryology, and zoology (bacteriology is especially recommended), (2) one full academic year (a minimum of 9 quarter hours or 6 semester hours) of beginning inorganic chemistry, which may include qualitative analysis, including lectures and laboratory, and in addition a minimum of 4 quarter hours or 3 semester hours of either quantitative analysis, organic chemistry or biochemistry, including lectures and laboratory (quantitative analysis is especially recommended), (3) electives sufficient to give a total of 90 quarter hours or 60 semester hours of college credit The following courses are highly recommended but they are not required physics, a course in general mathematics, and typing

11 Only those individuals having the above educational requirements may participate as students in this entire program Schools are encouraged to accept only students having three years of college and to participate in affiliated programs leading to a degree

12 Effective Jan 1, 1962, the pre-technical educational requirements for admission to a school of medical technology approved by the Council will be increased from two years (60 semester or 90 quarter hours) to three years (90 semester hours or 135 quarter hours) to include additional courses to broaden the science background

Pretechnical educational requirements effective Jan 1, 1962 Three years (90 semester hours or 135 quarter hours) of collegiate training in any college or university approved by a recognized regional accrediting agency are required The three years of college should be acceptable as the first three years of a baccalaureate program in medical technology When preparatory training is properly integrated with professional training in a hospital school affiliated with a college or university, such training could lead to a baccalaureate degree in medical technology Accredited collegiate training in preparation for the study of medical technology, as for any professional career, should provide the opportunity for a broad general education to include English, social sciences, arts, and humanities

During the three years the following courses are required *Chemistry*, a minimum of four semesters or 16 semester hours (six quarters or 24 quarter hours) including lecture and laboratory, acceptable toward a major in chemistry, is required Survey courses are not acceptable This must include one full academic year (two semesters or three quarters) of a general college chemistry course including lecture and laboratory which may include qualitative analysis It is strongly recommended that at least one semester or quarter of quantitative analytical chemistry be taken The other chemistry courses to complete the requirements may be selected from qualitative chemistry, quantitative chemistry, organic chemistry, biochemistry, physical chemistry or other chemistry courses acceptable toward a chemistry major *Biologic sciences*, a minimum of four semesters or 16 semester hours (six quarters or 24 quarter hours) acceptable toward a major in biologic science, is required This must include one full academic year (two semesters, three quarters) of a general biology and zoology, or both, course including lecture and laboratory The remaining biology courses to complete the requirements may be selected from the following subjects physiology, comparative anatomy, bacteriology, parasitology, histology, histologic technic, genetics, or other biology courses acceptable toward a biologic science major It is strongly recommended that at least one semester or three semester hours (one quarter or four quarter hours) of a basic bacteriology course including lecture and laboratory be taken *Mathematics*, a minimum of one semester or three semester hours (one quarter or four quarter hours) of college mathematics is required

It is strongly recommended that a course in physics be included in the college courses taken

Certification of the proficiency of a student by a college in any of the above required subjects may be accepted in lieu of these requirements, however, the student must still satisfy the three year requirement of 90 semester hours (135 quarter hours)

V Curriculum

13 The course of training should not be less than 12 months in duration and should include the following subjects biochemistry, hematology, bacteriology, parasitology, histologic technic, serology, urinalysis, blood banking, basal metabolism, and miscellaneous clinical microscopy.

14 The instruction should follow a planned outline similar to "A Curriculum for Schools of Medical Technology" of the Board of Registry of Medical Technologists and should be accomplished by text assignments, lectures and discussions, demonstrations, supervised practice, quizzes and written oral, and practical examinations

VI Clinical Material

15 Each student should receive practice training, adequate in kind and amount, under competent supervision Participating hospitals should be accredited and be otherwise acceptable to the Council on Medical Education and Hospitals of the American Medical Association Approved schools should have available laboratory material equivalent to that provided by a hospital of 100 beds and 3,000 yearly admissions and a minimum of 50,000 tests a year with a distribution of clinical material sufficient to provide adequate technical training in the various laboratory divisions

VII Ethics

16 Excessive fees and commercial advertising should be considered unethical

17 Schools conducted primarily for the purpose of substituting students for paid technologists will not be considered for approval

VIII Health

18 Applicants shall be required to submit evidence of good health and successful vaccination, and a report of a medical examination should be a part of the students' records This examination shall include a roentgen examination of the chest Provisions should be made for medical care and hospitalization, when necessary, for a reasonable length of time

IX Admission to the Approved List

19 Application for approval of a school for the training of technologists should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N Dearborn St, Chicago 10, Ill Forms will be supplied for this purpose on request and should be completed by the director of the laboratory requesting this approval Inquiries regarding the registration of qualified medical technologists should be addressed to the Board of Registry of Medical Technologists, Post Office Box 44, Muncie, Ind

20 Approval may be withdrawn whenever in the opinion of the Council a school does not maintain an educational service in accordance with the above standards Whenever a training program has not been in operation for a period of two consecutive years, approval may also be withdrawn

21 Approved schools should notify the Council on Medical Education and Hospitals whenever a change occurs in the directorship of the school

X-Ray Technology

Introductory Statement —The Council on Medical Education and Hospitals of the American Medical Association, the American College of Radiology, the American Registry of X ray Technicians, and the American Society of X-ray Technicians participate in a cooperative program to develop and maintain the highest standards in schools offering training in x ray technology These advisory groups developed the "Essentials for an Accredited School of X-Ray Technology These Essentials are printed immediately following the list of approved schools of x-ray technology below, and were adopted in June, 1960 by the House of Delegates of the American Medical Association This revision provides that after July 1, 1962 only schools of x-ray technology which provide a course of training 24 months or more in length shall be eligible for approval by the Council on Medical Education and Hospitals A basic curriculum for a two-year course was also adopted as a part of the Essentials' to serve as a guide to directors of schools in organizing their training programs

The revision was adopted after a comprehensive study of trends and needs in the field of x-ray technology It is sincerely hoped that the revision will not result in eliminating from the "Approved List any presently approved school, but rather that the schools whose programs are now less than two years in length will extend their training programs It is interesting to note that during the period of 1952 to 1960 the number of two year schools has more than quadrupled, from 123 to 548

This voluntary, and prior, acceptance of the two-year program as a basic minimal requirement for training has been brought about by the realization that any shorter period will not provide the essential training necessary for the x ray technicians to perform their tasks competently and with safety to patients and personnel The cautionary reports of the National Academy of Sciences regarding the biological effects of radiation have emphasized the need for not only sound judgment on the part of the physician in evaluating indications for certain types of radiological examinations, but also the need for proficiency and care in the conduct of such examinations

A Bradley Soule, Jr , M D , Chairman
Commission on Technician Affairs
American College of Radiology

Statistical Analysis —As of June 30, 1960 there were 650 schools approved by the Council on Medical Education and Hospitals for training x-ray technicians This represents an increase of 7% over the 609 schools approved in 1959 Total enrollment of 5,049 students was reported for 1959 representing a 10% increase in the number of students over the previous year The total capacity of the 650 schools was reported to be 5,875 with 86% occupancy or an increase in occupancy of 10% over last year There were 2,285 graduates in 1959, representing an increase of 156 graduates over the figure for 1958

The minimal admission requirements of all schools is graduation from high school This requirement is held by 621 schools, whereas 19 schools require at least one year of college and 9 schools require two years of college or that the applicant be a registered nurse One school accepts only registered nurses

The length of training in 548 schools is 24 months, an increase of 11% over last year of schools with this length of training program Twenty schools offer programs of 18 months in length and 58 schools require only 12 months of training Seventeen schools show programs of 13 to 48 months, varying with the type of program Collegiate affiliations have been established in 204 of the approved schools It is to be hoped that more schools will effect such affiliations not only as a means of calling to the attention of qualified young men and women the opportunities available to them, but also to broaden the base for training in x-ray technology

Tuition is required in only about one-third of the schools A stipend is paid to students in 501 schools The amount of the stipend and the students eligible to receive it varies from school to school Interested high school students and students at the college level should apply directly to the radiologist-director of an approved school, a list of which follows

Application for approval of a school for the training of x-ray technologists should be made to the Council on Medical Education and Hospitals of the American Medical Association Forms will be supplied for this purpose to be completed by the director of the school requesting this approval Inquiries regarding registration of qualified x-ray technicians should be addressed to the American Registry of X-ray Technicians, 2600 Wayzata Blvd , Minneapolis 5, Minn

Essentials of An Accredited School of X-Ray Technology

Prepared by the Council on Medical Education and Hospitals of the American Medical Association
Revised to June 16, 1960

Preamble

The organizations primarily concerned with the training of x-ray technicians are the Council on Medical Education and Hospitals of the American Medical Association, the American College of Radiology, the American Society of X-Ray Technicians, and the American Registry of X-Ray Technicians The Council, in collaboration with the American College of Radiology, functions by surveying, reporting, and approving these schools The Registry investigates, examines, and certifies the competency of technicians applying for registration

The Council, with the cooperation of the College, the Society, and the Registry has established the following minimal standards for this type of training for the information of technical schools, physicians, hospitals, prospective students and others, and for the protection of the public

Individuals are being trained in these schools to work as technicians under the direction of Radiologists and other qualified Doctors of Medicine and not independently

(Continued on page 1509)

Approved Schools of X-Ray Technology

Approved by
Council on Medical Education and Hospitals of the American Medical Association
in collaboration with
The Commission on Technician Affairs
of the
American College of Radiology

Revised to November 8, 1960
Number of Schools, 650

Name and Location of School	College Affiliation	Radiologist in Charge	Entrance Requirements	Length of Training in Months	Student Capacity	Classes Begin	Tuition
ALABAMA							
University Hospital and Hillman Clinic, Birmingham	*University of Alabama† Howard College† Birmingham Southern College†*	R F Roth M D	High School	21	21	Jan July	$100¹
Holy Name of Jesus Hospital Gadsden		H G Ford M D	High School	21	8	Varies	None¹
Mobile Infirmary, Mobile		J D Peake M D	High School	24	[illegible]	June	None¹
Druid City Hospital, Tuscaloosa		W A Askew M D	High School	12 24	6	June	None¹
ARIZONA							
Memorial Hospital Phoenix		D D Gain M D	High School	24	[illegible]	Varies	None¹
St Joseph s Hospital, Phoenix		J J Riordan M D	High School	24	20	Feb July	None¹
St Mary's Hospital Tucson		H D Welsh M D	High School	21	12	Sept	None¹
ARKANSAS							
Sparks Memorial Hospital, Fort Smith		F A Mendelsohn M D	High School	21	16	July	None¹
Arkansas Baptist Hospital, Little Rock		J B Scruggs M D	High School	24	12	July	None¹
St Vincent Infirmary Little Rock		W J Rhinehart, M D	High School	24	16	Sept	$50¹
University Hospital Little Rock	University of Arkansas Medical Center	H W Barnhard M D	High School	24	24	Sept	$200¹
CALIFORNIA							
Mercy Hospital, Bakersfield*	Bakersfield Jr College	J A Hartman M D	High School	24	2	Sept	None¹
Herrick Memorial Hospital Berkeley		K R Dehlinger M D	High School	24	6	Varies	$200¹
St Joseph Hospital Burbank		G M Campion M D	High School	21	4	Jan June	$200¹
City of Hope Medical Center, Duarte		H I Gildenhorn M D	High School	21	8	July	None¹
St Joseph Hospital, Eureka		W H Yeider, M D	High School	21	4	Jan July	None¹
Fresno Community Hospital Fresno		N N Keep M D	2 yrs college	21	1	Jan July	None¹
St Jude Hospital, Fullerton	Orange Coast College	J W Ryel M D	High School	12 21	1	Varies	None¹
Glendale Sanitarium and Hospital Glendale		O J Neufeld M D	1 yr college	21	9	Feb July	$100¹
Mission Hospital, Huntington Park		J P Fraleigh M D	High School	21	2	Varies	None¹
California Hospital, Los Angeles		W Hiemstra M D	High School	21	20	Varies	$50¹
Cedars of Lebanon Hospital, Los Angeles		D L Zion, M D	High School	1[illegible]	1[illegible]	July Sept	None
Childrens Hospital, Los Angeles		H G Peterson Jr M D	High School	21	12	Jan July	$50¹
College of Medical Evangelists Los Angeles	College of Medical Evangelists	W I Stilson M D	1 yr college	21	10	Mar Sept	$100
Los Angeles County Hospital Los Angeles		G Jacobson M D	2 yrs college or R N	24	12	Varies	None¹
University of California Hospital Los Angeles	University of California	J J Stein M D	1 yr college	21	16	Varies	None¹
St Francis Hospital Lynwood		K H Kent M D	High School	21	[illegible]	Jan	None¹
Highland Alameda County Hospital, Oakland		H H Jensen, M D	High School	21	6	Sept	None¹
Orange County General Hospital Orange	Orange Coast College	D L Lawson M D	2 yr college	15	1	July	None¹
St Joseph Hospital, Orange*	Orange Coast College†	R N Shelton M D	2 yrs college	1[illegible]	3	July Sept	None¹
Palo Alto Stanford Hospital Center, Palo Alto	Stanford University	H S Kaplan M D	High School	24	[illegible]	Sept	$1[illegible] mo
Huntington Memorial Hospital Pasadena	Pasadena City College	R S Harrison M D	2 yrs college	24	3	July	None¹
Mercy Hospital, Sacramento*		C C Wright M D	1 yr college	21	4	Sept	None
Sutter Community Hospitals Sacramento		R McFall M D	High School	21	8	Jan July	None¹
San Diego County General Hospital San Diego		I L Whitehead M D	High School	24	4	July	None¹
Children's Hospital, San Francisco	San Francisco City College†	G G King M D	2 yrs Jr college	12	4	Feb Sept	None¹
Franklin Hospital San Francisco	City College of San Francisco†	A J Williams M D T M Fullenlove M D	High School	33	4	Varies	$[illegible]¹
Mt Zion Hospital and Medical Center San Francisco		J Levitin M D	High School	21	4	Feb Sept	$17[illegible]¹
St Joseph Hospital, San Francisco	San Francisco City College	H A Hill M D	High School	21	1	Jan July	None¹
University of California, San Francisco	University of California School of Medicine	R S Stone M D	1 yr college	12	6	Sept	$13[illegible]
Veterans Administration Hospital, San Francisco	San Francisco City College†	M Roth M D	2 yrs college	36	3	Feb June	None
O'Connor Hospital, San Jose	San Jose State College	T N Foster M D	High School	24	[illegible]	Jan June	None¹
Santa Clara County Hospital, San Jose	*San Jose Junior College*	J J McCort M D	2 yrs college	24	6	July	None¹
St Francis Hospital, Santa Barbara		F T Feldsted M D H Tivey M D	High School	21	4	Varies	None¹
St John s Hospital Santa Monica		J E Havel M D	High School	24	8	Jan July	None¹

Name and Location of School	College Affiliation	Radiologist in Charge	Entrance Requirements	Length of Training in Months	Student Capacity	Classes Begin	Tuition
CALIFORNIA—Continued							
San Joaquin General Hospital Stockton		A M Cove M D	High School	24	5	July	None
Los Angeles County Harbor General Hospital Torrance		J H Woodruff Jr M D	High School	24	8	July	None¹
COLORADO							
Penrose Hospital Colorado Springs		J W McMullen M D J A del Regato M D	High School	24	12	Sept	None¹
St Francis Hospital Colorado Springs		N J Bolton M D C W Partington M D	High School	24	9	Jan June	None¹
Colorado General Hospital Denver	University of Colorado Boulder	D M Gould M D	High School	24	40	Sept	$100
Denver General Hospital Denver		F Salzman M D	High School	24	16	July	None¹
General Rose Memorial Hospital Denver		M H Levine M D J H Weiss M D	High School	24	10	Sept	$50¹
Mercy Hospital Denver		F J Corishek M D N C La Fourrette Jr M D	High School	24	10	July	None¹
Presbyterian Hospital Denver	University of Denver*	K D A Allen M D	High School	24	10	Varies	None¹
St Anthony Hospital Denver		M DeF Smith Jr M.D	High School	24	12	Sept	$100
St Joseph's Hospital Denver		C S Maresh M D	High School	24	11	Sept	$50¹
St Luke's Hospital Denver		W P Stampfli M D	High School	24	10	Sept	$100
St Mary's Hospital Grand Junction		C F Shopfner M D	High School	24	6	July	None¹
Weld County Public Hospital Greeley		P D Weaver M D	High School	24	10	July	None¹
St Mary Corwin Hospital Pueblo		W K Absher M D	High School	24	8	Sept	None¹
CONNECTICUT							
Bridgeport Hospital Bridgeport		J J Esposito M D	High School	24	10	Sept	None¹
St Vincent's Hospital Bridgeport		R D Russo M D	High School	24	10	July	None
Hartford Hospital Hartford	University of Hartford†	R J Ogden M D	High School	24	18	Sept	None¹
Mount Sinai Hospital Hartford		J Bernstein M D	High School	24	1	July	None¹
St Francis Hospital Hartford		F J Sennett M D	High School	24	16	July	None¹
Manchester Memorial Hospital Manchester		W J Conlon M D	High School	24	4	July	None¹
Middlesex Memorial Hospital Middletown	Yale University	W F Catlin M D	High School	24	4	July	$25¹
New Britain General Hospital New Britain		J C Larkin M D	High School	24	12	Sept	$100¹
Memorial Unit Grace New Haven Community Hospital New Haven	Yale University	R M Lowman M D	High School	24	20	July	$100¹
New Haven Unit Grace New Haven Community Hospital New Haven	Yale University	R H Greenspan M D	High School	24	12	July	None¹
Hospital of St Raphael New Haven		R Shapiro M D	High School	24	15	Sept	$75¹
Lawrence Memorial Hospital New London		F J Fagan M D	High School	24	8	July	None¹
St Joseph's Hospital Stamford		J P Connolly M D	High School	24	7	Sept	$100¹
St Mary's Hospital Waterbury		K R Kaess M D	High School	24	16	Sept	None¹
Waterbury Hospital Waterbury		J M James M D	High School	24	12	July	None¹
DELAWARE							
Delaware Hospital Wilmington		W W Tattomus M.D	High School	24	8	July	None¹
Wilmington General Hospital Wilmington		S T Miller M D	High School	24	8	July Sept	None
DISTRICT OF COLUMBIA							
Georgetown University Hospital Washington	Georgetown University	W F Baensch M D	High School	24	15	Sept	$100¹
Providence Hospital Washington		J A Long M D	High School	24	10	Sept	None¹
FLORIDA							
Baptist Memorial Hospital Jacksonville		P A Mori M D C Newell M D	High School	24	10	July	None¹
Duval Medical Center Jacksonville		W P Scott M D	High School	24	10	July	None¹
St Luke's Hospital Jacksonville		W S Rizk M D	High School	24	5	Sept	$50¹
St Vincent's Hospital Jacksonville		M V McClow M D A W Clark M D	High School	24	12	Jan July	None¹
Jackson Memorial Hospital Miami	University of Miami	R E Parks M D	High School	24	23	Oct	$100¹
Mercy Hospital Miami*		J R Galluccio M D	High School	24	6	Annually	None¹
Orange Memorial Hospital Orlando		R W Curry M D	High School	24	4	July	None
Bay Memorial Hospital Panama City		D H Anderson M D	High School	12	3	June	None¹
Sacred Heart Hospital Pensacola		N Arenson M D	High School	12	3	Sept	None
Mound Park Hospital St Petersburg		L Freed M D	High School	24	8	July	None¹
GEORGIA							
Crawford W Long Memorial Hospital Atlanta	Emory University	R A Elmer M D	High School	12 24	18	Monthly	$100¹
Emory University Hospital Atlanta	Emory University	J F Leigh M D	High School	24	11	July	$100¹
Georgia Baptist Hospital Atlanta		J Long M.D	High School	24	6	Jan June	None¹
Grady Memorial Hospital Atlanta		H S Weens M D	High School	24	28	Jan July	None¹
Piedmont Hospital Inc Atlanta*		F G Smith Jr M D	High School	12	6	Varies	None¹
Eugene Talmadge Memorial Hospital Augusta	Medical College of Georgia	R Wigh M D	High School	24	8	Sept	None¹
University Hospital Augusta		S W Brown M D	High School	24	12	July	None¹
Medical Center Columbus		C J Epps M D	High School	24	9	June July	None¹
St Francis Hospital Columbus		G M Hutto M D	High School	24	3	June	None¹
Hamilton Memorial Hospital Dalton		H U Martin M D	High School	12	3	Nov	None¹
John J Hutcheson Memorial Tri County Hospital Ft Oglethorpe		G L Hixson M D	High School	24	6	July	None¹
Hall County Hospital Gainesville		O T Chent M D	High School	12	3	July	None¹
Macon Hospital Macon		W H Somers M D	High School	24	20	Jan July	$100¹
Kennestone Hospital Marietta		W H Mathis Jr M D	High School	24	4	July	None¹
HAWAII							
St Francis Hospital Honolulu		R D Moore M D	High School	24	4	Sept	None¹

Name and Location of School	College Affiliation	Radiologist in Charge	Entrance Requirements	Length of Training in Months	Student Capacity	Classes Begin	Tuition
IDAHO							
St Alphonsus Hospital, Boise		J B Morris MD	High School	24	10	Sept	None[1]
St Luke's Hospital Boise	Boise Junior College	A M Popma MD	High School	24	6	Sept	Univ [1]
Sacred Heart Hospital, Idaho Falls		R A Butz MD	High School	24	4	June	None[1]
Mercy Hospital Nampa*		F W Cottrell MD	High School	24	4	May	None[1]
Samaritan Community Hospital, Nampa*		F W Cottrell, MD	High School	24	2	Mar	None[1]
ILLINOIS							
Copley Memorial Hospital, Aurora		I J Wachowski, MD C F Whitney, Jr MD	High School	24	7	Sept	None[1]
St Charles Hospital, Aurora		R M Geist MD R G Olsen MD	High School	24	3	Jan July	None[1]
St Joseph Mercy Hospital, Aurora*		H Slobodin, MD	High School	24	12	Jan July	None[1]
St Francis Hospital, Blue Island		R B White, MD J W Koenig MD	High School	24	10	July	None
Alexian Brothers Hospital, Chicago**		C Colangelo, MD	High School	24	6	Sept	$50[1]
Augustana Hospital, Chicago*		D S Bellin, MD	R N	24	1	Fall	None[1]
Cook County Graduate School of Medicine Chicago		I F Hummon MD	High School	12	30	Jan July	$200
Edgewater Hospital Chicago		A K Bonk MD	High School	18	11	Spr Fall	None[1]
Englewood Hospital Chicago		A M Bernstein, MD	High School	24	3	Spr Fall	None[1]
Evangelical Hospital, Chicago*		R J Maier, MD E K Lewis, MD R E Bodwin, MD G F Koptik Jr, MD	High School or R N	24	8	July Oct	$50[1]
Grant Hospital, Chicago		A M Pantone, MD M Melamed, MD	High School	24	2	July	None[1]
Illinois Masonic Hospital Chicago		J H Gilmore, MD	High School	12	4	Jan July	$100
Lutheran Deaconess Hospital Chicago		F L Hussey Sr MD	High School	24	8	Varies	None[1]
Michael Reese Hospital, Chicago*		B Levin MD	High School	18	12	Jan July	None[1]
Mount Sinai Hospital Chicago		J Nadelhaft, MD	High School	18	10	Jan July	None
Norwegian American Hospital Chicago		R H Warden, MD	High School	24	3	Varies	$200
Presbyterian St Luke's Hospital, Chicago*		F H Squire MD	High School	24	12	July	$80[1]
Provident Hospital, Chicago		W P Quinn MD	High School	24	10	Varies	$300
Ravenswood Hospital Chicago*		D L Jenkinson MD	High School	18	7	Varies	None[1]
St Anne's Hospital Chicago*	Loyola University	R M Cassidy, MD	High School	24	4	July	$100[1]
St Bernard's Hospital, Chicago*		L K Lewis MD R J Maier MD R F Bodwin, MD G F Koptik Jr, MD	High School or R.N	24	8	July Oct	$50[1]
St Elizabeth's Hospital Chicago		J Brams MD	High School	24	10	Varies	None[1]
St George's Hospital Chicago*		R E Bodwin MD R J Maier, MD F K Lewis MD G F Koptik, Jr, MD	High School or R N	24	8	July Oct	$50[1]
St Joseph Hospital, Chicago	DePaul University	R J Borgerson, MD	High School	24	6	Sept	None[1]
St Mary of Nazareth Hospital, Chicago		D C Wharton MD	High School	24	18	Sept	$70[1]
South Chicago Community Hospital, Chicago		B D Braun, MD	High School	24	8	Varies	None[1]
University of Illinois Research and Educational Hospitals Chicago	University of Illinois	R A Harvey, MD	High School	24	2	Fall	None[1]
Woodlawn Hospital, Chicago		L Donaldson, MD	High School 1 yr college	24	4	Quarterly	None[1]
Lake View Memorial Hospital Danville	Danville Junior College	R W Donnelly MD	High School	24	2	Sept	None[1]
Decatur and Macon County Hospital, Decatur	Millikin University	R F Kinzer, MD	High School	24	6	June	None[1]
Dixon Public Hospital, Dixon		S L Parks MD	High School or R N	12	2	Varies	None[1]
Centreville Township Hospital, East St Louis		F F Bihss, MD	High School	24	8	July	None[1]
Memorial Hospital of DuPage County, Elmhurst		G Ormbeck MD	High School	24	8	Jan July	$50[1]
Little Company of Mary Hospital, Evergreen Park		J Brosnan, MD	High School	24	14	Sept	$40[1]
Ingalls Memorial Hospital Harvey	Purdue University	M Indovina, MD	High School	24	6	Varies	None[1]
Hinsdale Sanitarium and Hospital, Hinsdale		A P Dado, MD	High School	24	8	Jan	$100[1]
Silver Cross Hospital, Joliet		R M Geist Jr, MD	High School	24	4	July	None[1]
St Mary's Hospital, Kankakee		W Mullen, MD R M Geist, Jr, MD	High School	24	8	Varies	None[1]
Kewanee Public Hospital, Kewanee		P D Binder, MD	High School	24	6	Jan Sept	None[1]
Moline Public Hospital Moline	Moline Community College	W Hartung MD	High School	24	8	Sept	None[1]
West Suburban Hospital Oak Park		C R Snead, MD	High School	24	8	Sept	$100
Methodist Hospital of Central Illinois Peoria		F H Decker MD	High School	24	9	May to Aug	None[1]
St Francis Hospital, Peoria		P R Dirkse MD D F Anderson MD G F Zwicky, MD	High School	24	12	Feb to Sept	$100[1]
Blessing Hospital, Quincy		G M Perisho, MD	High School	24	4	Aug	None[1]
Rockford Memorial Hospital, Rockford		B Roseberg MD W R Sneed Jr, MD	High School	24	12	July	None[1]
St Anthony Hospital, Rockford		E J Lang, MD J Bailey, MD	High School	24	8	Varies	$50[1]
Swedish American Hospital, Rockford		H W Vanlandingham MD	High School	24	16	Varies	None
St Anthony's Hospital, Rock Island*		J H Raymond, MD	High School	24	6	Sept	$250[1]
Memorial Hospital, Springfield		J F King, MD	High School	24	10	Varies	$200[1]
St John's Hospital, Springfield		W DeHollander MD	High School	24	4	June	$110
Carle Memorial Hospital, Urbana		C Gianturco, MD G A Miller MD	High School	24	4	July	None[1]

Name and Location of School	College Affiliation	Radiologist in Charge	Entrance Requirements	Length of Training in Months	Student Capacity	Classes Begin	Tuition
INDIANA							
St Catherine Hospital East Chicago	Purdue University†	B D Braun, M D	High School	24	12	July	$100[1]
Elkhart General Hospital Elkhart	Goshen College	L G Ericksen M D	High School	24	17	Sept	None
Lutheran Hospital Fort Wayne		J Rodriguez M D	High School	24	10	July	$150[1]
Parkview Memorial Hospital Fort Wayne		R C Datzman M D	High School	24	18	Sept	$100[1]
St Joseph s Hospital Fort Wayne	Purdue University	C H Warfield M D	High School	24	12	July	$200[1]
Methodist Hospital Gary	Purdue University	J P Bennett M D	High School	24	8	July	$100[1]
St Margaret Hospital Hammond*	Purdue University	C Rosenthal M D	High School	24	4	Jul Aug	$300[1]
Indiana University Medical Center Indianapolis	Indiana University	J A Campbell M D	High School	24	35	Sept	$180
Methodist Hospital Indianapolis		H C Ochsner M D	High School	24	24	Spring	None[1]
Reid Memorial Hospital Richmond		M D Wertenberger M D	High School	24	6	Apr Oct	None[1]
Memorial Hospital South Bend		L G Fricksen M D	High School	24	5	Sept	None
St Anthony Hospital Terre Haute		H J Pierce M D T W Hogan M.D G Eversman M D	High School	24	10	Varies	$50[1]
Porter Memorial Hospital Valparaiso		R H Schmidt M.D	High School	24	6	June Sept	None[1]
Good Samaritan Hospital Vincennes		B Corsentino M D	High School	24	4	Varies	None[1]
IOWA							
Mercy Hospital, Cedar Rapids		J A Prouty M D	High School	24	7	Sept	None[1]
St Luke s Methodist Hospital Cedar Rapids		J A Prouty M D	High School	24	8	Sept	None[1]
Mercy Hospital Council Bluffs*	Creighton University	J B Conlon M D	High School	24	6	Sept	Univ [1]
Iowa Methodist Hospital Des Moines		A B Phillips M D	High School	24	6	Sept	$100[1]
Finley Hospital Dubuque	University of Dubuque†	R P Rusk M D R C Orvis M D	High School	24	4	July	Univ [1]
St Joseph Mercy Hospital Dubuque		R P Rusk M D	High School	24	7	June	None[1]
Xavier Hospital Dubuque		M S Lagen M D D R Baughman M D	High School	24	6	June Sept	$200[1]
Sacred Heart Hospital Fort Madison		L E Adams M D	High School	24	2	Varies	None[1]
Mercy Hospital Iowa City		G M Wyatt M.D	High School	24	6	July	$50[1]
State University Hospitals Iowa City	University of Iowa	E F Van Epps M D	High School	12	24	Mar Sept	$58
St Joseph Mercy Hospital Mason City		H. W Morgan M D P W Morgan M D J R Utne M D	High School	24	6	July	None[1]
Ottumwa Hospital Ottumwa		S F Singer M D R A Hastings M D W W Ireland M D	High School	24	8	Jan July	None[1]
St Joseph Hospital Ottumwa	Ottumwa Heights College	J H Stewart M D A T Austin M D	High School	24	6	Sept	$100[1]
St Joseph Mercy Hospital Sioux City		V T Scoville M D	High School	24	8	July	$200[1]
St Vincent s Hospital Sioux City		C M Marriott M.D	High School	24	12	July	$125
Allen Memorial Hospital Waterloo		M. M Wicklund M D	High School	24	4	July	None[1]
Schoitz Memorial Hospital Waterloo	Iowa State Teachers College†	J L Kestel M D C J Ludwig M D	High School	24	2	Varies	None[1]
KANSAS							
Hadley Memorial Hospital Hays		A M Cherner M.D	High School	24	2	June Sept	None[1]
Grace Hospital Hutchinson*		L F Glaser M D	High School	24	3	June	None[1]
St Elizabeth Mercy Hospital Hutchinson		I F Glaser M D	High School	24	4	June	None[1]
Bethany Hospital Kansas City*		L R Goertz M D	High School	24	6	June Sept	None[1]
Providence Hospital Kansas City		P E Hiebert M D	High School	24	6	June July	None[1]
St Margaret s Hospital Kansas City*	Donnelly College†	W R Allen M.D	High School	24	10	July	None[1]
University of Kansas Medical Center Kansas City	University of Kansas	G M Tice M.D	High School	24	15	May to Sept	None[1]
Asbury Hospital Salina		G S Ripley Jr M.D	High School	24	2	Varies	None[1]
Stormont Vail Hospital Topeka	Washburn University	H L Hiebert M D	High School	24	4	May	None[1]
St Francis Hospital Wichita		J R Kline M.D	High School	24	19	Jan July	None[1]
Wesley Hospital Wichita	University of Wichita	N C Nash M.D	High School	24	16	June Sept	None[1]
Wichita St Joseph Hospital Wichita		E J Fitzgerald M D	High School	24	12	Sept	None[1]
KENTUCKY							
King s Daughters Hospital Ashland		W L Cawood M D	High School	24	3	Sept	$100[1]
St Elizabeth Hospital Covington*		N Adair M.D	High School	24	12	June	None[1]
Good Samaritan Hospital Lexington		R D Shepard M D	High School	24	8	July	None[1]
St Joseph Hospital Lexington		R C Quillin M D	High School	24	10	Sept	$25[1]
Kentucky Baptist Hospital Louisville		H I Townsend M.D	High School	24	24	July	$50
Louisville General Hospital Louisville	University of Louisville	F L Pirkey M D	High School	24	23	Jan July	$100
Norton Memorial Infirmary Louisville		G M Peterson M D	High School	24	6	June	$40[1]
St Anthony Hospital Louisville	Nazareth College†	C R Ulferts M D	High School	24	3	July	Univ [1]
St Joseph Infirmary Louisville		S E Johnson M D	High School	24	12	Sept	None[1]
LOUISIANA							
St Frances Cabrini Hospital Alexandria		A M Alexander Jr M D	High School	24	3	Feb	None[1]
Charity Hospital of Louisiana New Orleans		C M. Nice Jr M.D	High School	24	48	July	$50[1]
Hotel Dieu Sisters Hospital, New Orleans		H M Duhe M D	High School	24	2	July	None[1]
Mercy Hospital Soniat Memorial New Orleans	Loyola University	J T Brierre M.D	High School	24	8	August	None[1]
Southern Baptist Hospital New Orleans		L W Eavenson M D	High School	24	8	July	$150[1]
Touro Infirmary New Orleans		A R Layzant M D	High School	12 24	6	Aug	$150
U S Public Health Service Hospital New Orleans		D MacKillop M D	High School	24	4	Quarterly	None[1]

Name and Location of School	College Affiliation	Radiologist in Charge	Entrance Requirements	Length of Training in Months	Student Capacity	Classes Begin	Tuition
LOUISIANA—Continued							
Confederate Memorial Medical Center Shreveport		P Riley, M D	High School	24	16	Feb July	None[1]
Schumpert Memorial Sanitarium Shreveport		G M Riley, M D	2 yrs college	24	1	July	None[1]
MAINE							
Augusta General Hospital Augusta		F J O Connor, M D	High School	24	6	July	None
Central Maine General Hospital Lewiston*		C F Miller, M D	High School	24	7	Sept	None[1]
St Mary s General Hospital Lewiston		J T Konecki M D	High School	24	10	July	None[1]
Maine Medical Center Portland	Westbrook Junior College	J T Gibbons, M D	High School	24	20	July Sept	$150[1]
Mercy Hospital Portland*		G F C Logan M D	High School	24	6	Varies	None[1]
Sisters Hospital Waterville	Colby College	A A Poulin, M D	High School	24	8	July	$125[1]
Thayer Hospital Waterville	Colby College	A A Poulin M D	High School	24	8	July	$125[1]
MARYLAND							
Anne Arundel General Hospital Annapolis		R H Armstrong Jr, M D	High School	24	4	Varies	None[1]
Baltimore City Hospitals Baltimore		J DeCarlo Jr, M D	High School	24	12	Varies	None[1]
Johns Hopkins Hospital Baltimore		R H Morgan M D	High School	24	65	Sept	$100[1]
St Agnes Hospital Baltimore		F R Perilla, M D	High School	24	3	Sept	None[1]
Sinai Hospital of Baltimore Inc Baltimore		J O Salik M D	High School	24	23	Sept	None[1]
South Baltimore General Hospital Baltimore		G J Farber, M D	High School	24	8	June Sept	None[1]
University of Maryland Hospital Baltimore	University of Maryland	J M Dennis M D	High School	24	17	July	None[1]
U S Naval Hospital Bethesda		Capt J R King, MC USN	High School	12	80	Varies	None[1]
Washington County Hospital, Hagerstown		S H Macht M D	High School	24	1	Jan July	$25[1]
Peninsula General Hospital Salisbury		W H Dumeyer M D	High School	21	5	July	None[1]
MASSACHUSETTS							
Beth Israel Hospital Boston	Northeastern University	F G Fleischner M D	High School	12	5	Sept	None
Boston City Hospital Boston	Northeastern University	M Ritvo M D	High School	24	5	Sept	$120
Massachusetts General Hospital Boston	Northeastern University	L L Robbins, M D	High School	12	8	July	None[1]
Massachusetts Memorial Hospitals Boston*	Northeastern University	G Levene M D	High School	12	4	July Sept	None
New England Center Hospital Boston*	Northeastern University	A Ettinger, M D	High School	24	4	Varies	None[1]
New England Deaconess Hospital Boston	Northeastern University	J H Marks, M D	High School	12	2	July	Univ[1]
Peter Bent Brigham Hospital, Boston	Northeastern University	J B Dealy, Jr M D	High School	18	6	Quarterly	$150
St Elizabeth s Hospital, Brighton	Northeastern University	W A Carey, M D	High School	12	6	July Sept	None[1]
Cambridge City Hospital Cambridge	Northeastern University	F A Herzan M D	High School	21	2	Sept	None
Mount Auburn Hospital Cambridge*	Northeastern University	R Schatzki M D	High School	24	4	July	Univ[1]
Truesdale Hospital Fall River	Northeastern University	S W Udis M D	High School	21	4	Sept	None[1]
Framingham Union Hospital Framingham	Northeastern University	J Ferrucci M D	High School	12	2	July	Univ[1]
Addison Gilbert Hospital Gloucester*		E P Wells M D	High School	12	4	Mar Sept	None[1]
Franklin County Public Hospital Greenfield		D P Ham M D R I Davies M D	High School	12	2	Sept	None[1]
Providence Hospital Holyoke		F J Harrington M D	High School or R N	24	6	Spr Fall	$50[1]
Faulkner Hospital Jamaica Plain	Northeastern University	J F Hawes M D	High School	12	2	July	None[1]
Lawrence General Hospital, Lawrence		G V West M D	High School	24	6	Sept	$200
Lowell General Hospital, Lowell*	Northeastern University	C J Shagoury M D	High School	12	3	July Sept	Univ
St John s Hospital Lowell*	Northeastern University	M C Mehan M D	High School	12	4	July Sept	Univ[1]
Lynn Hospital Lynn	Northeastern University	W J Goade Jr, M D	High School	24	8	July Sept	Univ[1]
Union Hospital, Lynn*	Northeastern University	L D Savage, M D	High School	24	2	July	None[1]
Malden Hospital Malden*	Northeastern University	G A Hanna, M D	High School	24	4	July	Univ[1]
Lawrence Memorial Hospital Medford	Northeastern University	J L Golden, M D	High School	12	2	July	None[1]
Bon Secours Hospital Methuen	Northeastern University	E P Quinn M D	High School	12	2	Sept	None
St Luke's Hospital New Bedford	Northeastern University	E O Lewis M D	High School	12	4	July	None[1]
Newton Wellesley Hospital, Newton Lower Falls*	Northeastern University	J Hanelin M D	High School	12	3	July Sept	None[1]
Cooley Dickinson Hospital, Northampton		T J Crowe M D M Sharpe, M D	High School	21	2	Mar Sept	None[1]
Pittsfield General Hospital, Pittsfield		J F Gowdey M D	High School	24	2	Sept	$100[1]
St Luke s Hospital Pittsfield		D J Barnett M D	High School	24	5	Sept	$100[1]
Quincy Hospital Quincy	Northeastern University	W S Altman M D	High School	24	6	July Sept	None[1]
Salem Hospital Salem	Northeastern University	R W Liming M D	High School	12 24	6	July	None[1]
South Shore Hospital, So Weymouth	Northeastern University	F W Wiklund, M D A S Sabino, M D	High School	24	3	Jan July	Univ
Mercy Hospital, Springfield		B B Alicandri M D	High School	24	8	Spr Fall	$100[1]
Springfield Hospital, Springfield*		R A Grugan, M D	High School	24	8	Annually	None[1]
Wesson Memorial Hospital, Springfield*		J W Turner, M D	High School	24	6	Annually	None[1]
New England Sanitarium and Hospital, Stoneham	Northeastern University	H P Mueller M D	High School	24	4	Sept	$100[1]
Waltham Hospital, Waltham		R G O Brien M D	High School	12	3	July	None[1]
Charles Choate Memorial Hospital Woburn	Northeastern University	J L Golden, M D E N Burke, M D	High School	24	2	June	None[1]
St Vincent Hospital Worcester*		J F Sheehan M D	High School	24	6	July Sept	$100[1]
MICHIGAN							
St Joseph Mercy Hospital, Ann Arbor		S W Donaldson M D	High School	18	12	Mar Sept	None[1]
Lelia Y Post Montgomery Hospital Battle Creek		S P Barden M D	High School	24	8	July	$200[1]
Mercy Hospital Benton Harbor		P O Ragué M D	High School	21	9	July	None[1]
Detroit Memorial Hospital Detroit		J E Lofstrom M D	High School	24	14	July	$100[1]

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MICHIGAN—Continued							
Grace Hospital Detroit		J S Figiel M D	High School	24	12	July	$150[1]
Henry Ford Hospital Detroit		W R Eyler M D	High School	24	20	Jan July	$150[1]
Jennings Memorial Hospital Detroit		E C Jewell M D	High School	14	1	July	None[1]
Mount Carmel Mercy Hospital Detroit	Mercy College	J M Grace M D	High School	24	12	Sept	$100[1]
St John Hospital Detroit		H W Devine M D	High School	24	7	Sept	None
St Joseph Mercy Hospital Detroit		S Malina M D	High School	24	6	Sept	None[1]
Saratoga General Hospital Detroit		F C Jewell M D	High School	12	1	July Sept	None[1]
Wayne County General Hospital Eloise		J Zbikowski M D	High School	24	6	June	None
Hurley Hospital Flint		D R Limbach M D	High School	24	13	Sept	$100[1]
McLaren General Hospital Flint		P W Dorsey M D J J Anderson M D	High School	24	3	Sept	None[1]
St Joseph Hospital Flint		J F Ilvenas M D	High School	24	10	July	None[1]
Blodgett Memorial Hospital Grand Rapids		J A Gunn M D	High School	24	6	June	None[1]
Butterworth Hospital Grand Rapids		E F Wahby M D	High School	24	6	Sept	None[1]
St Mary's Hospital Grand Rapids		R R Benson M D	High School	24	5	July	None[1]
W A Foote Memorial Hospital Jackson	Jackson Jr College	A K Payne M D	High School	24	8	June Sept	$90 sem[1]
Edward W Sparrow Hospital Lansing		W D Cheney M D	High School	24	4	Sept	None[1]
St Luke's Hospital Marquette	Northern Michigan College of Education	J B Bolitho M D	High School	18	2	Feb Sept	$115[1]
St Joseph Hospital Mt Clemens		A Curatolo M D	High School	24	8	Feb Sept	$100
Hackley Hospital Muskegon	Muskegon Community College	J F Holly M D	High School	24	9	Sept	Univ[1]
Pontiac General Hospital Pontiac		Z E Endress M D	High School	24	8	Mar Sept	None
St Joseph Mercy Hospital Pontiac		E J Keeffe M D	High School	12	2	Varies	None
MINNESOTA							
St Olaf Hospital Austin	University of Minnesota	S C Peterson M D	High School	24	9	Quarterly	None
St Joseph's Hospital Brainerd	University of Minnesota	R J Pedersen M D	High School	24	4	Sept	Univ[1]
St Francis Hospital Breckenridge		W A Shaver M D	High School	24	4	Aug	None
Bethesda Hospital Crookston	University of Minnesota	C S Boyer M D	High School	24	3	Jan July	None[1]
St Mary's Hospital Detroit Lakes	University of Minnesota Moorhead State College	C W Parker M D	High School	24	2	Varies	Univ[1]
Duluth Clinic Foundation Duluth*		H C Moehring M D	High School	24	10	July	None[1]
St Luke's Hospital Duluth	Hamline University	A J Abraham M D	High School	24	22	Varies	$25
St Mary's Hospital Duluth		J R McNutt M D	High School	24	16	Sept	None[1]
Fairmont Community Hospital Fairmont	University of Minnesota	J Bellomo M D	High School	24		July	None
Lake Region Hospital Fergus Falls	Moorhead State College	W A Shaver M D D A Campbell M D	High School	24	4	July	$50[1]
Hibbing General Hospital Hibbing	University of Minnesota	B Halper M D	High School	24	6	Jan June	None
Abbott Hospital Minneapolis	University of Minnesota	O J Baggenstoss M D	High School	15, 24	4	Spring Fall	Univ
Eitel Hospital Minneapolis	University of Minnesota	R J Beiswanger M D	High School	12	2	Varies	None[1]
Fairview Hospital Minneapolis	University of Minnesota	C M Kelby M D	High School	24	12	Jan June	$100[1]
General Hospital Minneapolis	University of Minnesota	O Lipschultz M D	High School	15	29	Varies	None
Methodist Hospital Minneapolis	University of Minnesota	R F Nord M D	High School	24	8	Quarterly	Univ[1]
Mt Sinai Hospital Minneapolis	University of Minnesota	S B Feinberg M D	High School	24	6	Jan June	Univ
Northwestern Hospital Minneapolis	University of Minnesota	C O Hansen M D	1 yr college	24	3	Varies	Univ
St Barnabas Hospital Minneapolis*		A W Naslund M D	High School	24	10	July	$100[1]
St Mary's Hospital Minneapolis		C N Borman M D	High School	24	18	Sept	$100[1]
Swedish Hospital Minneapolis	University of Minnesota	J C Idstrom M D	High School	24	12	Jan June	$200[1]
University of Minnesota Hospitals Minneapolis	University of Minnesota	H O Peterson M D	High School	24	30	Varies	$100
Owatonna City Hospital Owatonna*	University of Minnesota	J Merner M D	High School	15	2	Jan June	None[1]
Saint Cloud Hospital St Cloud		D W Undem M D	High School	24	12	Sept	$200
Bethesda Lutheran Hospital St Paul*	University of Minnesota	R C B Bjornson M D F R Sterner M D	High School	18	15	Quarterly	None[1]
Charles T Miller Hospital St Paul		J B Coleman M D	High School	18	18	Varies	None
St John's Lutheran Hospital St Paul	University of Minnesota	B Hall M D	High School	15	6	Jan July	None[1]
St Joseph's Hospital St Paul	University of Minnesota	T P Medelman M D	High School	24	4	Jan June	Univ
Rice Memorial Hospital Willmar	University of Minnesota	W F Macklin Jr M D	High School	24	4	June	Univ
MISSISSIPPI							
General Hospital Greenville		W C Yarbrough M D	High School	12	2	Feb July	None[1]
Mississippi Baptist Hospital Jackson		J F Harris M D R P Henderson M D J M Packer M D	High School	24	11	June July	None[1]
St Dominic Hospital Jackson		T W Evans M D	High School	12	2	Jan June	None[1]
University Medical Center Jackson	University of Mississippi	R D Sloan M D	High School	12	8	June Nov	None[1]
Mercy Hospital Street Clinic Vicksburg		J B Dominick M D	High School	24	4	Varies	None[1]
Vicksburg Hospital Inc Vicksburg		F J Hamernik M D	High School	24	5	June July	None[1]
MISSOURI							
St Louis County Hospital Clayton		S J Merenda M D	High School	24	15	July	None[1]
St Elizabeth Hospital Hannibal		J M Birch M D	High School	24	4	Varies	None[1]
Independence Sanitarium and Hospital Independence		T F Bowser M D	High School	24	6	Sept	None[1]
Kansas City Hospital No 1 Kansas City		J W Barry M D	High School	24	16	Spring Fall	None[1]
Kansas City General Hospital No 2 Kansas City		T F Ramos M D	High School	24	6	Annually	None[1]
Menorah Medical Center Kansas City		D S Dann M D S Rubin M D	High School	24	10	June	None[1]
Research Hospital and Clinic Kansas City		J W Walker M D	1 yr college or R.N	24	15	Jan July	None[1]
St Joseph Hospital Kansas City		J F Schiffmacher M D	High School	24	8	Sept	$75[1]
St Luke's Hospital Kansas City		L A Scarpellino M D	High School	24	12	Jan July	$25[1]
St Mary's Hospital Kansas City		W M Kitchen M D	High School	24	10	Sept	None[1]
Alexian Brothers Hospital St Louis		C J Nolan M D	High School	24	3	Sept	$50[1]
De Paul Hospital St Louis		R P Ernst M.D	High School	24	12	June	$180[1]
Evangelical Deaconess Hospital St Louis		T C Peden M D	High School	24	12	Sept	$125[1]

Name and Location of School	College Affiliation	Radiologist in Charge	Entrance Requirements	Length of Training in Months	Student Capacity	Classes Begin	Tuition
MISSOURI—Continued							
Homer G Phillips Hospital, St Louis		W F Allen Jr MD	High School	24	20	Sept	$15 mo
Jewish Hospital, St Louis		H R Senturia MD	High School	24	9	Sept	None¹
Missouri Baptist Hospital St Louis		C M Witt MD	High School	24	6	Jan Sept	None¹
St John's Hospital St Louis	St Louis University	J C Peden MD	High School	24	12	Sept	$150
St Louis University, St Louis	St Louis University‡	L R Sante MD	High School	48	22	Varies	Univ
St Luke's Hospital St Louis		H W Frerking MD	High School	24	6	Varies	None¹
St Mary's Infirmary St Louis*		W F Allen MD	High School	24	4	Sept	$200
Washington University Medical School St Louis	Washington University	H M Wilson MD	High School	24	16	July	$100¹
Burge Hospital, Springfield		M W Dietz MD	High School	24	12	Quarterly	None
St John's Hospital Springfield	Southwest Missouri State College	M L Napper MD D D Anthony MD	High School	24	6	July	None¹
MONTANA							
St Vincent's Hospital Billings		W Francke MD	High School	24	3	Varies	None¹
Columbus Hospital Great Falls	Great Falls College	F M Petkevich MD	High School	24	10	Sept	$311 50¹
Montana Deaconess Hospital Great Falls		W W Copeland MD	High School	12	2	Jan July	None
St Patrick Hospital Missoula		J J Drouillard MD	High School	24	6	Sept	$50¹
NEBRASKA							
St Francis Hospital, Grand Island		B B Woodruff MD	1 yr college	24	8	July Sept	None¹
Mary Lanning Memorial Hospital Hastings	Hastings College	W J Richard MD	High School	24	6	Jan June	$100¹
St Elizabeth Hospital Lincoln		J T McGreer MD	1 yr college	24	11	Varies	$100¹
Creighton Memorial St Joseph's Hospital, Omaha	Creighton University‡	J F Kelly Sr, MD	High School	24	13	Jan June	$200¹
Immanuel Hospital Omaha	Omaha University	L R James MD	High School	24	5	July	$200¹
St Catherine's Hospital Omaha	Creighton University	J F Kelly Sr MD	High School	24	6	Sept	Univ ¹
University of Nebraska College of Medicine Omaha	University of Nebraska‡	H B Hunt MD	High School	24	9	Varies	Univ
NEW HAMPSHIRE							
Concord Hospital Concord		W H Butterfield MD	High School	24	2	July	None¹
Mary Hitchcock Memorial Hospital Hanover		J K Sycamore MD	High School	24	6	July	None¹
Laconia Hospital, Laconia*		G Lamlett MD	High School	24	5	July	None¹
Sacred Heart Hospital, Manchester*	Mt St Mary College	P Y Hasserjian MD	High School	24	5	Sept	None¹
NEW JERSEY							
Jersey City Medical Center Jersey City	Seton Hall College of Medicine	H J Perlberg MD	High School	24	36	Sept	None
Bergen Pines County Hospital Paramus		E M Bogardus MD	High School	24	8	Sept	None¹
Paterson General Hospital Paterson		E I Warren MD	High School	24	16	Quarterly	None¹
St Joseph Hospital Paterson		E R Schell MD	High School	24	12	Sept	None¹
Princeton Hospital Princeton*		E W Godfrey MD	High School	24	4	Mar Sept	None¹
Overlook Hospital Summit		G M Himadi MD	High School	12	4	Sept	$150
Holy Name Hospital, Teaneck		J J Davis MD	High School	24	3	Sept	$200¹
Helene Fuld Hospital Trenton*		W J Bonnet MD	High School	24	5	July	None¹
Mercer Hospital Trenton	Trenton Junior College	A N Conte MD	High School	24	6	Varies	None¹
St Francis Hospital, Trenton		B M Schmitt MD	High School	24	12	July	$300¹
NEW MEXICO							
Bernalillo County Indian Hospital Albuquerque		J J Wolfson MD	High School	24	1	August	None¹
St Joseph Sanatorium and Hospital Albuquerque		O Legant MD	High School	24	8	Sept	None¹
Lea General Hospital Hobbs		W G McPheron MD	High School	24	3	Spring	None¹
St Vincent Hospital Santa Fe		M M Friedman MD	High School	24	10	Varies	None¹
NEW YORK							
Albany Hospital Albany	Albany Medical College	J F Roach MD	High School	24	20	Sept	$200¹
Edward J Meyer Memorial Hospital, Buffalo	University of Buffalo‡	L G Eschner MD	High School	24	14	July	None¹
Mercy Hospital Buffalo	Canisius College Rosary Hill College	C G Jenczeski MD	High School	24	10	Sept	Univ
Millard Fillmore Hospital Buffalo		F H Schnap, MD	High School	24	12	Sept	None¹
Roswell Park Memorial Institute Buffalo	University of Buffalo	F P Lessmann MD	High School	24	5	Jan Sept	None¹
Brooks Memorial Hospital Dunkirk		S B Clark MD	High School	24	4	Jan July	$100¹
St Joseph's Hospital Elmira		H A Burch MD	High School	24	8	Oct	$150¹
Glens Falls Hospital Glens Falls		R C Batt MD	High School	24	2	Sept	None¹
St James Mercy Hospital Hornell*		W J MacFarland MD	High School	24	6	Sept	None
Nassau Hospital Mineola L I		J A Knapp MD	High School	12	23	Sept	$30 60
Memorial Center for Cancer and Allied Diseases New York		R S Sherman MD	High School	24	11	Oct	None¹
New York Hospital New York		J A Evans MD	High School	24	36	Oct	$400¹
New York Polyclinic Medical School and Hospital New York	New York Polyclinic Post Graduate Medical School	W H Shehadi MD	High School	24	12	Oct	$300¹
Roosevelt Hospital New York	New York University	A A Dunn MD	High School	24	24	Feb June	$300¹
St Clare's Hospital New York		N M Albanese MD	High School	24	12	Mar Sept	$35¹
St Francis Hospital, New York		H De Liso MD	High School	24	20	Sept	$100¹
St Vincent's Hospital New York	New York University	F F Ruzicka Jr MD	High School	18	6	Jan July	$300¹
Fox Memorial Hospital Oneonta	Hartwick College State Teachers College	J S House MD J R Clarke MD	High School	24	8	Jan July	None
Genesee Hospital, Rochester		G J Baron MD	High School	24	3	June Sept	None¹
Rochester General Hospital Rochester		E F Merrill MD	High School	12	6	July Sept	$150
St Mary's Hospital Rochester	Georgetown University	H H Forsyth Jr MD	High School	24	8	July	None¹
Strong Memorial Hospital, Rochester	University of Rochester	G H Ramsey MD	High School	12	15	Sept	$150
St Clare's Hospital Schenectady		H P Curran MD	High School	24	16	Sept	$100¹
Southampton Hospital Southampton*		K W Horne MD	High School	24	4	July Sept	None¹

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NORTH CAROLINA							
Memorial Mission Hospital Asheville	Asheville Biltmore College	I S Raper M D	High School	24	8	Sept	None[1]
North Carolina Memorial Hospital Chapel Hill	University of North Carolina	F H Wood M D	High School	16	18	Sept	$25
Charlotte Memorial Hospital Charlotte*		W C A Sternbergh M D	High School	15	12	June	$100
Mercy Hospital Charlotte	Belmont Abbey College Sacred Heart College	I C Clenn Jr M D	High School	24	10	Jan July	$100
Cabarrus Memorial Hospital Concord		A Tuggle M D	High School	24	8	June Aug	$100[1]
Duke University Medical Center Durham	Duke University	R J Reeve M D	High School	24	12	Sept	$50[1]
Watt Hospital Durham		S P Perry M D	High School	24	8	July	$100
Moses H Cone Memorial Hospital Greensboro*		E D Apple M D	High School	24	6	Feb Sept	$100
Rex Hospital Raleigh		T C Worth M D	High School	24	8	Jan July	$50[1]
Park View Hospital Rocky Mount*		E L Seigman M D	High School	24	4	June Sept	None[1]
Rowan Memorial Hospital Salisbury		T G Thurston M D J E Wear M D	High School	24	5	Varies	$50-
Johnston Memorial Hospital Smithfield		C C Bolin Jr M D	High School	24	4	Jan July	None[1]
City Memorial Hospital Winston Salem		H S Adams M D	High School	18	4	July	None[1]
Kate Bitting Reynolds Memorial Hospital Winston Salem		J G Gordon M D	High School	24	2	July	None[1]
North Carolina Baptist Hospital (Bowman Gray School of Medicine) Winston Salem		I Meschan M D	High School	24	24	Sept	$100[1]
NORTH DAKOTA							
Quain and Ramstad Clinic Bismarck	University of Minnesota	H M Berg M D	High School	24	4	Varies	None[1]
St Alexius Hospital Bismarck	Moorhead State College	H M Berg M D	High School	24	6	Varies	Univ [1]
St John's Hospital Fargo	Moorhead State College	I L Donat M D	High School	24	4	Sept	$90[1]
St Joseph Hospital Minot	Moorhead State College	M Wallis M D	High School	24	3	Sept	None[1]
Trinity Hospital Minot*		W W Wall M D	High School	12	5	Varies	None[1]
OHIO							
Akron City Hospital Akron		F T Moore M D	High School	24	24	Varies	None[1]
Akron General Hospital Akron		C J Miller Jr M D	High School	24	14	Jan July	$50[1]
Children's Hospital Akron		N Glazer M D	High School	24	16	June	None[1]
St Thomas Hospital Akron		E F Somma M D	High School	24	10	June	None[1]
Barberton Citizens Hospital Barberton		J F Ulrich M D	High School	24	12	June	None[1]
Aultman Hospital Canton		S Larson M D	High School	24	12	July	None[1]
Mercy Hospital Canton		T J Dodd M D	High School	24	12	Sept	$100[1]
Cincinnati General Hospital Cincinnati		B Felson M D	High School	24	30	Sept	$75[1]
Good Samaritan Hospital Cincinnati		J E McCarthy M D	High School	24	14	Sept	None[1]
Jewish Hospital Cincinnati		I S Rosenberg M D	High School	24	7	June	None[1]
Our Lady of Mercy Hospital Mariemont Cincinnati	Our Lady of Cincinnati College,	C M Barrett M D	High School	24	4	Varies	$75[1]
Cleveland Metropolitan General Hospital Cleveland		H Hauser M D	High School	18	14	Monthly	$150
Frank E Bunts Educational Institute Cleveland		C R Hughes M D	High School	24	12	Sept	None[1]
Mt Sinai Hospital Cleveland		G R Krause M D M Lubert M D	High School	24	8	Varies	$100[1]
St Luke's Hospital Cleveland		D D Brannan M D	High School	24	10	Varies	$100[1]
St Vincent Charity Hospital Cleveland		F J O Malley M D	High School	12	4	Feb July	$100
University Hospital of Cleveland Cleveland	Western Reserve University	H L Friedell M D	High School	14	18	Monthly	$100
Doctors Hospital Cleveland Heights	Western Reserve University	R O Turek M D	High School	12	6	Varies	$100
Ohio State University Hospital Columbus		S W Nelson M D	High School	24	24	Jan July	None[1]
White Cross Hospital Columbus	Ohio State University	W H Carter M D W B Schwartz M D D R Schmidt M D	High School	36	5	May	None[1]
Good Samaritan Hospital Dayton		A J Brogan M D	High School	24	12	July	None[1]
Miami Valley Hospital Dayton		C A Nicoll M D	High School	24	12	July	None[1]
St Elizabeth Hospital Dayton	University of Dayton,	J G Tye M D	High School	24	12	July	$50[1]
Union Hospital Association Dover		E C Davis M D	High School	24	5	July	None[1]
Huron Road Hospital East Cleveland		W D Heinrich M D	High School	24	10	July	$100[1]
Elyria Memorial Hospital Elyria		D A Russell M D R D Berkebile M D	High School	24	9	June	$100[1]
Euclid Glenville Hospital Euclid		J D Osmond Jr M D	High School	24	4	Feb July	$100[1]
Marymount Hospital Garfield Heights		C J Morell M D	High School	12	6	Quarterly	$50[1]
Mercy Hospital Hamilton*		T P Glynn M D	High School	24	12	July	None[1]
St Rita's Hospital Lima		D W English M D	High School	24	8	July	None[1]
St Joseph Hospital Lorain		D A Russell M D	High School	24	7	July	$100[1]
Newark Hospital Newark*	Denison University	C A Erhard M D	High School	24	11	Sept	$100[1]
Providence Hospital Sandusky		R F Hoffman M D	High School	24	4	July	None[1]
Ohio Valley Hospital Steubenville		D S Greenberg M D	High School	24	5	Sept	None
Mercy Hospital Toledo	University of Toledo	M M Thompson Jr M D	High School	24	16	July Sept	None[1]
Trumbull Memorial Hospital Warren		R A Havill M D	High School	24	8	July	None[1]
St Elizabeth Hospital Youngstown		R J Scheetz M D	High School	24	6	July	None[1]
Youngstown Hospital Association (South Unit) Youngstown*		E C Baker M D	High School	24	16	Varies	None[1]
Good Samaritan Hospital Zanesville*	-	P A Jones M D	High School	24	6	Sept	$208
OKLAHOMA							
St Mary's Hospital Enid		L F Shryock M D	High School	24	6	Sept	None[1]
Mercy Hospital Oklahoma City	University of Oklahoma	J R Danstrom M D	High School	24	8	Feb Sept	None[1]
St Anthony Hospital Oklahoma City	Oklahoma City University,	C G Coin M D	High School	24	12	June Sept	None[1]
University Hospital Oklahoma City	University of Oklahoma	C R Ridings M D	High School	24	20	July	None[1]
Wesley Hospital Oklahoma City		E H Kalmon M D	High School	24	2	Jan July	None
Hillcrest Medical Center Tulsa	University of Oklahoma	D B Lhevine M D	High School	24	11	July	None[1]
St John's Hospital Tulsa		I M Pascucci M D	High School	24	16	Varies	$50[1]

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OREGON							
Emanuel Hospital Portland		J M Woolley M D	High School	24	6	Sept	None¹
Good Samaritan Hospital Portland*		G B Isenhart M D J R Raines, M D F C Shipps M D	High School	24	3	Varies	None
Physicians and Surgeons Hospital Portland		G B Isenhart M D	High School	24	4	Jan Sept	None¹
Portland Sanitarium and Hospital Portland		A Hunter M D	High School	24	3	Jan July	None¹
Providence Hospital Portland*		G B Nichols M D N I Blune M D	High School	24	2	July	None¹
St Vincent Hospital Portland		J A Schneider M D	High School	24	2	July	None¹
University of Oregon Medical School Hospitals and Clinics Portland	University of Oregon	C T Dotter M D	High School	24	24	July	None¹
PENNSYLVANIA							
Lower Bucks County Hospital Bristol*		W Mills M D	High School	24	2	July	None¹
Bryn Mawr Hospital Bryn Mawr		K M Harvey M D	High School	24	6	Sept	None
Butler County Memorial Hospital Butler		G A Smith M D	High School	24	8	Jan July	None¹
Chester Hospital Chester*		M J Blocklyn M D	High School	24	20	Sept	None¹
Coatesville Hospital Coatesville	West Chester State Teachers College	T J Cancelmo Jr M D	High School	24	8	Aug	None
Geisinger Memorial Hospital Danville		J I Williams M D	High School	24	5	Sept	None¹
Fitzgerald Mercy Hospital, Darby*		J K Alexander M D	High School	24	12	July	None
Easton Hospital Easton*		W G Johnson M D	High School	24	5	July	None¹
East Stroudsburg General Hospital East Stroudsburg		P H Shuffer M D B G Butler M D	High School	24	6	Jan July	None¹
Hamot Hospital Erie		R D Bacon M D	High School	24	7	July Aug	None¹
St Vincent's Hospital Erie		C B Lechner M D	High School	24	7	Varies	None¹
Westmoreland Hospital Greensburg		J F Maurer M D	High School	24	[illegible]	Jan	None
Harrisburg Polyclinic Hospital, Harrisburg		E H Foust M D	High School	24	6	June	None¹
Saint Joseph Hospital Hazleton*		T J Conahan M D	High School	24	4	July	None¹
Conemaugh Valley Memorial Hospital Johnstown		J W Wilson M D	High School	24	12	Jan	None¹
Nesbitt Memorial Hospital, Kingston*		H G Boyle, M D	High School	24	2	July	$50 mo¹
Armstrong County Memorial Hospital Kittanning		P G Bovard M D D W Minteer, M D	High School	24	4	June	None¹
St Joseph Hospital Lancaster*		R Deck Jr M D	High School	24	4	Sept	None¹
Sacred Heart Hospital Norristown		M A Myers M D	High School	24	8	July	None¹
Albert Einstein Medical Center, Northern Division Philadelphia		J Gershon Cohen M D	High School	24	26	Sept	None¹
Chestnut Hill Hospital Philadelphia*		R P Barden M D	High School	24	3	Feb Sept	None
Germantown Dispensary and Hospital Philadelphia		B K Young M D	High School	24	8	June	None
Graduate Hospital of the University of Pennsylvania Philadelphia	University of Pennsylvania	A K Finkelstein, M D	High School	24	16	Varies	$150²
Hahnemann Medical College and Hospital, Philadelphia	Hahnemann Medical College	J S Lehman M D	High School	24	24	Aug	$25
Hospital of the University of Pennsylvania Philadelphia	University of Pennsylvania	E P Pendergrass M D	High School	24	15	Sept	$50 yr
Jefferson Medical College Hospital Philadelphia	Jefferson Medical College	P J Hodes M D	High School	24	30	Sept	None¹
Lankenau Hospital Philadelphia		M M Meyers M D	High School	24	7	July	None¹
Misericordia Hospital, Philadelphia*		C J Rominger M D	High School	24	9	July Sept	None¹
Nazareth Hospital, Philadelphia*		J S Fetter M D	High School	24	13	July	$150¹
Philadelphia General Hospital, Philadelphia*		B P Widmann M D	High School	24	60	Sept	None
Veterans Administration Hospital Philadelphia		G P Wohl M D	High School	24	12	June Dec	None
Elizabeth Steel Magee Hospital Pittsburgh	University of Pittsburgh	C N Chasler M D	High School	24	[illegible]	Varies	None¹
Mercy Hospital Pittsburgh		C R Perryman M D	High School	24	24	Jan July	$100
Presbyterian Hospital, Pittsburgh	University of Pittsburgh	J C Lasser M D	High School	24	8	July	None¹
St Francis General Hospital and Rehabilitation Institute Pittsburgh		G H Alexander M D	High School	24	12	July	$100¹
Western Pennsylvania Hospital Pittsburgh		W S Mellon Jr, M D	High School	12	2	June Dec	None¹
Pottsville Hospital, Pottsville		C C Barclay, M D	High School	18	12	Sept	None
Rochester General Hospital, Rochester		W T Rice M D H H Richardson M D	High School	24	4	July	None¹
Robert Packer Hospital Sayre		J J Littleton M D	High School	24	12	July	None¹
Scranton State Hospital, Scranton		J J O'Brien M D	High School	24	4	Jan June	None¹
West Side Hospital, Scranton		R L Hickok M D	High School	24	4	June	None
Sharon General Hospital Sharon		A H Holt M D	High School	24	7	July	None¹
Washington Hospital Washington		J M Turich M D	High School	24	13	July	None¹
Chester County Hospital West Chester		J Gershon Cohen M D R N Byrne M D J S Bringhorst M D	High School	24	2	July	None¹
Reading Hospital West Reading*		G W Chamberlin M D	High School	12	4	Sept	$100
Mercy Hospital Wilkes Barre	College Misericordia	R J Kilhullen M D	High School	24	8	Aug	None
Wilkes Barre General Hospital Wilkes Barre*		P J Ringawa M D	High School	24	8	Aug	None¹
Divine Providence Hospital Williamsport		H J Machanic M D	High School	24	9	July	None¹

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RHODE ISLAND							
Memorial Hospital Pawtucket		F W Benjamin M D	High School	24	8	July	None[1]
Rhode Island Hospital Providence		L A Martineau M.D	High School	24	7	June	None[1]
Roger Williams General Hospital Providence		R R Hunt M D	High School	24	8	July	None[1]
St Josephs Hospital Providence*	Providence College	P J Votta M D	High School	24	6	June	None[1]
SOUTH CAROLINA							
Anderson Memorial Hospital Anderson		J J Davis M D	High School	24	8	Quarterly	None[1]
Medical Center Hospital Charleston		H S Pettit M D	High School	24	12	Sept	None[1]
Columbia Hospital Columbia		G W Smith Jr M D	High School	24	12	July	None[1]
South Carolina Baptist Hospital Columbia*		T A Pitts M D	High School	24	9	Sept	None[1]
Greenville General Hospital Greenville		J B Pressly M D	High School	24	8	July	$100[1]
Self Memorial Hospital Greenwood		W A Klauber M D	High School	24	4	July	None[1]
Orangeburg Regional Hospital Orangeburg		J H Atwill Jr M D	High School	24	8	Jan July	None[1]
Spartanburg General Hospital Spartanburg		H E Plenge M D	High School	24	9	Varies	None
Tuomey Hospital Sumter*		J H Barr M D	High School	24	4	July	$50[1]
SOUTH DAKOTA							
St Lukes Hospital Aberdeen*	Presentation Junior College	P V McCarthy M D	High School	24	12	June	$70[1]
McKennan Hospital Sioux Falls		D H Breit M D	High School	24	6	July Sept	$75
Sioux Valley Hospital Sioux Falls		D H Breit M D	High School	24	6	June Sept	$75
Sacred Heart Hospital Yankton	Mount Marty College	J P Steele M D	High School	24	8	Sept	$50
TENNESSEE							
Baroness Erlanger Hospital Chattanooga		C W Reavis M D	High School	24	24	July	$150
Holston Valley Community Hospital Kingsport		E K Carter M D	High School	24	7	July	None[1]
East Tennessee Baptist Hospital Knoxville	University of Tennessee	F T Rogers M D	High School	12	3	July	None[1]
University of Tennessee Memorial Research Center and Hospital Knoxville	University of Tennessee	W F Kraemer M D	High School	24	6	July	$100[1]
Madison Sanitarium and Hospital Madison	Madison College‡	G H Johnson M D	1 yr college	12	6	Quarterly	$480[1]
Baptist Memorial Hospital Memphis		M M Keirns M D	High School	24	8	Sept	None[1]
City of Memphis Hospitals Memphis	University of Tennessee	D S Carroll M D	High School-	12	16	Quarterly	$120
Methodist Hospital Memphis	University of Tennessee	J C King M D	High School	24	9	Jan July	None[1]
Mid State Baptist Hospital Nashville	Belmont College	J McK Ivie M D	High School	12	8	Jan June	None[1]
Vanderbilt University Hospital Nashville	Vanderbilt University	H C Francis M D	High School	24	15	Jan July	None[1]
TEXAS							
Hendrick Memorial Hospital Abilene	Hardin Simmons University	V H Shoultz M D	High School	18	4	Sept	$150[1]
Brackenridge Hospital Austin		J C Rude M D	High School	24	8	Sept	None[1]
Seton Hospital Austin	St Edwards University	R N Snider M D	High School	24	16	Sept	None[1]
Baptist Hospital of Southeast Texas Beaumont		H M Lowry M D	High School	24	16	Varies	None[1]
Hotel Dieu Hospital Beaumont*		G F Crawford M D	High School	12	10	June Sept	None[1]
Mercy Hospital Brownsville	Southmost Junior College	L Works M D	High School	24	4	Sept	None[1]
Spohn Hospital Corpus Christi		J E Gardner M D	High School	24	8	June	$50[1]
Baylor University Medical Center Dallas	Baylor University	J E Miller M D	High School	24	30	Monthly	None[1]
Methodist Hospital Dallas	Southwestern University	R H Millwee M D	High School	24	6	Quarterly	None
Parkland Memorial Hospital Dallas	Southwestern University	F J Bonte M D	High School	24	33	Monthly	None
St Paul Hospital Dallas	University of Dallas	M J Healy M D	High School	24	8	Sept	$400[1]
All Saints Hospital Terrell's Laboratory Fort Worth		H W Banker M D	High School	24	7	Varies	None[1]
John Peter Smith Hospital Fort Worth	Texas Wesleyan College	W H Neil M D	High School	24	8	Varies	None[1]
St Josephs Hospital Fort Worth		R D Moreton M D D E Bibby M D	High School	24	6	June	$50[1]
St Marys Hospital Galveston*		E H Stirling M D	High School	24	8	July Sept	Univ [1]
University of Texas Medical Branch Hospitals Galveston	University of Texas	R N Cooley M D	High School	24	14	Sept	$300[1]
Hermann Hospital Houston		L M Vaughan M D	High School	24	11	July	None[1]
Jefferson Davis Hospital Houston	Baylor University	V P Collins M D	High School	24	13	Jan July	None[2]
M D Anderson Hospital and Tumor Institute Houston	University of Texas	G D Dodd Jr M D	High School	24	8	July Oct	None[1]
Methodist Hospital Houston	Baylor University	C H Burge M D	High School	24	4	Jan Sept	$40[1]
St Josephs Hospital Houston	Sacred Heart Dominican College	C W Yates M D L L Lemak M D	High School	24	12	July	$50[1]
St Lukes and Texas Childrens Hospital Houston*		E B Singleton M D	High School	12	2	Varies	$50[1]
Methodist Hospital Lubbock		G M Jones M D	High School	18	6	June Nov	None[1]
Orange Memorial Hospital Orange		A R Watson M D	High School	24	7	July	None[2]
St Marys Hospital Port Arthur		W C Holman M D	High School	24	9	Jan June	None[1]
Robert B Green Memorial Hospital San Antonio		B D King M D	High School	24	11	Jan July	None[1]
Santa Rosa Hospital San Antonio	Incarnate Word College*	F E O Neill M D	High School	24	16	Sept	$100[1]
Danforth Memorial Hospital Texas City	--	J B Johnson Jr M D	High School	24	4	Jan	None[1]
Medical Center Hospital Tyler	Tyler Junior College	J Selman M D	High School	24	4	July	$300[1]
Mother Frances Hospital Tyler	Tyler Junior College	J Selman M D	High School	24	8	July	$150[1]
Providence Hospital Waco	Baylor University	W H Granger M.D	High School	18	4	July	None[1]
Bethania Hospital Wichita Falls		J D Steed M D	High School	24	6	Jan July	$50[1]
UTAH							
St Benedicts Hospital Ogden		L P Matthei M D	High School	24	4	Sept	$120[1]
Utah Valley Hospital Provo	Brigham Young University	H J Brown M D	1 yr college	18	5	Varies	None[1]
Salt Lake County General Hospital Salt Lake City	University of Utah	W R Christensen M D	High School	24	-	Jan	None[1]

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VERMONT							
DeGoesbriand Memorial Hospital Burlington		F W VanBuskirk M D	High School	24	8	July	$250¹
Mary Fletcher Hospital, Burlington	University of Vermont	A B Soule Jr, M D	High School	24	20	July	$250¹
VIRGINIA							
University of Virginia Hospital Charlottesville	University of Virginia	A W Archer, M D	High School	24	12	Sept	None¹
Warren Memorial Hospital Front Royal	Medical College of Virginia	H W Stinson M D	High School	24	4	Sept	None¹
Mary Immaculate Hospital, Newport News*		Q T Legg, M D	High School	24	2	Sept	None¹
Riverside Hospital Newport News		Q T Legg, M D	High School	24	4	Varies	None¹
DePaul Hospital Norfolk		T Foster M D	High School	24	11	July	$50¹
Leigh Memorial Hospital Norfolk*		K K Wallace M D	High School	24	4	July	None¹
Norfolk General Hospital, Norfolk		C P Wisoff M D	High School	24	14	Sept	None
Medical College of Virginia Hospital Division Richmond*	Medical College of Virginia	I B Mandeville M D	High School	24	30	Varies	None
Richmond Memorial Hospital Richmond		D P King, M D	High School	24	10	July	None¹
St Luke's Hospital Richmond*		J N Clore Jr M D	High School	12	2	Jan July	None¹
Winchester Memorial Hospital Winchester		J McI Adams M D T T Johnson M D	High School	24	2	Varies	None¹
WASHINGTON							
Mason Clinic-Virginia Mason Hospital Seattle		T Carlile M D	High School	12	4	Sept	None¹
Providence Hospital, Seattle	Seattle University‡	D P Christie M D	High School	18	16	Mar Sept	$50¹
St Joseph's Hospital Tacoma	Tacoma Catholic Junior College‡	J R Flynn M D	High School	12	6	June Sept	$100
Veterans Administration Hospital Vancouver		C B Atkins M D	1 yr college	12	2	April	None¹
St Elizabeth's Hospital, Yakima	Yakima Valley Junior College	J F Downing M D P A Lynch M D	High School	24	4	July	None¹
WEST VIRGINIA							
Beckley Hospital, Beckley*		T I Martin M D	High School	24	1	Varies	None¹
St Luke's Hospital, Bluefield*		W J Copenhaver M D	High School	12	8	June	None
Kanawha Valley Memorial Hospital Charleston*		W P Elkin, M D	High School	24	4	Varies	None¹
McMillan Hospital Charleston*		W P Elkin M D	High School	18	1	Varies	None¹
Memorial Hospital Association, Charleston		J W Squire M D	High School	24	14	Jan June	None¹
St Francis Hospital Charleston*		P Francke, M D	High School	24	2	Varies	None¹
Cabell Huntington Hospital Huntington		C I McKay, M D	High School	24	8	Jan June	None¹
Camden Clark Hospital Parkersburg		F I Potter M D	High School	24	8	June	None
Myers Clinic-Broaddus Hospital, Philippi	Alderson-Broaddus College‡	K J Myers M D	High School	36	12	Sept	Unk ²
Herbert J Thomas Memorial Hospital, South Charleston*		T D Kugel M D	High School	24	15	June Sept	None¹
Ohio Valley General Hospital Wheeling		A K Butler M D	High School	18	9	July	None¹
WISCONSIN							
St Joseph's Hospital Ashland		C I Ahrens M D	High School	24	4	Fall	$50¹
Beloit Hospital Beloit		T L Babb M D	High School	24	8	July	None¹
Sacred Heart Hospital Eau Claire	University of Wisconsin	R C Frank M D	High School	24	4	July	$50¹
St Agnes Hospital Fond du Lac		H Mauthe M D	High School	24	8	Sept	$100
Bellin Memorial Hospital, Green Bay		J H Edelblute M D	High School	24	8	Sept	$25
Mercy Hospital, Janesville		J H Betlach M D	High School	24	7	Sept	$50
Adolf Gundersen Medical Foundation LaCrosse	University of Minnesota	G A Gundersen M D	High School	24	3	Mar Sept	$50¹
St Francis Hospital LaCrosse		P A Hulick M D	High School	24	8	Sept	$50¹
St Mary's Hospital Madison		O A Stiennon M D	High School	24	12	Sept	None
University Hospitals Madison	University of Wisconsin	J W Paul M D	High School	24	13	Quarterly	None
St Joseph's Hospital Marshfield		J M Wickham M D	High School	24	7	July	$50¹
Columbia Hospital Milwaukee		S A Morton M D	High School	24	8	Jan July	None¹
Evangelical Deaconess Hospital Milwaukee		A Melamed M D	High School	24	12	Annually	$100¹
Milwaukee County Hospital Milwaukee		T R Amberg M D	High School	24	16	Jan July	None
Milwaukee Hospital Milwaukee*		J L Armbruster M D	High School	24	16	Apr Oct	None¹
Misericordia Hospital, Milwaukee		R S Jobling M D	High School	24	3	Varies	None¹
Mt Sinai Hospital Milwaukee		M Moel M D	High School	24	8	Feb Aug	$50¹
St Joseph's Hospital Milwaukee		G W Sengpiel M D	High School	24	16	Sum Fall	$50¹
St Luke's Hospital Milwaukee		C E Schmidt, M D	High School	24	8	July	None¹
St Mary's Hospital Milwaukee	University of Minnesota	K D Epperson M D J A Schelble M D	High School	24	6	Varies	Unk ¹
Mercy Hospital, Oshkosh		S R Beatty M D D T Ryan M D	High School	24	5	June Sept	$50¹
Sheboygan Memorial Hospital Sheboygan*		W W Mon M D	High School	12	2	Varies	None¹
St Mary's Hospital Wausau		J M Foerster M D	High School	24	12	Sept	$65¹
WYOMING							
Memorial Hospital of Laramie County Cheyenne		J W Barber M D	High School	12 24	8	Jan July	None¹
W R Coe Memorial Hospital Cody		M J Smith M D	High School	24	4	Jan July	None

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* Only female students admitted
** Only male students admitted
† College credit received
‡ Degree granted
¹ Students are paid a stipend
² Scholarship available

I Administration

1 Acceptable schools for training x-ray technicians may be conducted by approved medical schools or by radiology departments affiliated with accredited general hospitals A complete radiology department with a sufficient volume and variety of x ray examinations should be maintained A radiology department which performs at least 6,000 examinations each year should provide sufficient material for proper instruction It is recommended that at least 1,500 examinations per student enrolled be performed annually, exclusive of photofluorography, and that adequate facilities for training in radiation therapy be available Under special circumstances schools may be developed in specialty hospitals such as a pediatric institution or in general hospitals where experience may not be possible in radiation therapy or in the performance of some of the more complex radiologic procedures such as pneumoencephalography, angiocardiography and others In such cases, the school should arrange for affiliation with some other hospitals to provide students training and experience in these fields

2 The department shall comply with standard safety regulations for safety protection

3 All training of technicians shall be under competent radiologic supervision

4 Resources for continued operation of the school should be insured through regular budget, gifts, or endowments A reasonable tuition fee may be charged to compensate the school for part of the costs of instruction and for the purchase of library books, teaching aids, and other materials Small stipends may be permitted during the latter months of training

II Organization

1 Affiliation with an accredited college, university, or medical school is desirable but not essential When such an affiliation exists, an advisory committee should be established including representatives from the school and from the departments of the college, university, or medical school which participate in the training program

2 Adequate space, light, and modern equipment should be provided in the radiology department A library containing up-to-date references, texts, and scientific periodicals pertaining to x-ray technic should be maintained and be readily accessible to the students

3 Satisfactory records should be kept for all work carried on in the department

4 Records of students' college and other credentials should be on file Records should be kept of each student s attendance and grades as well as the number and types of technical procedures performed An outline of the curriculum and the rotation of assignments should be available in the radiologist's office

5 Two or preferably more students should be enrolled in each class Approval is withdrawn automatically if a school does not have any students for a period of two years, unless a satisfactory reason is provided

6 An annual report of schools of x-ray technology should be submitted to the Council promptly upon request

7 Periodic re-survey will be carried out by the Council on Medical Education and Hospitals of the American Medical Association in collaboration with the American College of Radiology Notification to the Council and re-evaluation shall be required if the Radiologist in charge of the training program is changed

III Faculty

The school should have a competent teaching staff The directing radiologists must be a duly licensed physician who is well qualified, experienced, and proficient in his specialty He shall be eligible for certification by, have been certified by the American Board of Radiology, or have qualifications acceptable to the Council on Medical Education and Hospitals In addition to his qualifications in his specialty, he should have high professional standing and possess the attributes of the teacher He shall be in regular attendance for sufficient time to supervise adequately the training program

There should be at least one instructor who is a trained x-ray technician, registered, or eligible for registration by the American Registry of X-Ray Technicians, who may serve as assistant director of the school Under him should be a corps of well-trained technicians who are capable of assisting in classroom instruction as well as in the practical teaching of students There should be at least one qualified technician instructor for each three students

IV Admission Requirements

It is suggested that preference should be given to applicants between the ages of 18 and 30 years of age Candidates for admission should satisfy one of the following minimum requirements

(*a*) Completion of four years of high school or the passing of a standard equivalency test Courses in physics, chemistry, biology, algebra, geometry, and typing are strongly recommended

(*b*) Passing of a college entrance examination for admission to an accredited college or university

V Curriculum

1 The course of training should be a minimum of 24 months effective July 1, 1962 Adequate vacation periods should be allowed for each 12 months of training The following suggested basic curriculum is presented as a guide

Two Year Course in X-Ray Technology with suggested order of presentation

First Year—First Semester	*Theory Clock Hours*
Orientation and Elementary Radiation Protection	5
Professional Ethics	4
Anatomy and Physiology	30
Physics	20
Darkroom Chemistry and Technique	10
Principles of Radiographic Exposure I	10
Radiographic Positioning—Section A	15
Film Critique	20
Total	114

First Year—Second Semester	*Theory Clock Hours*
Physics (cont'd)	20
Radiographic Positioning—Section A (cont'd)	15
Principles of Radiographic Exposure I (cont'd)	10
Common Radiographic Procedures Using Contrast Media	8
Nursing Procedures Pertinent to Radiology	10
Pediatric Radiography	8
Film Critique	20
Total	91

Second Year—First Semester	*Theory Clock Hours*
Radiographic Positioning—Section B	30
Principles of Radiographic Exposure II	10
Protection to Patients and Personnel	10
Special Radiographic Procedures	20
Topographic Anatomy	12
Film Critique	20
Elective	4
Total	106

Second Year—Second Semester	*Theory Clock Hours*
Radiation Therapy*	10
Intraoral Radiography	8
A Survey of Medical and Surgical Diseases	15
Departmental Administration	10
Equipment Maintenance	6
Film Critique	20
General Review	20
Total	89

Electives
- Psychology
- Medical Use of Radioisotopes
- Photography
- Principles of Teaching
- Research in Relation to the X-Ray Technician
- Technical Writing
- Radiological Mathematics for Technicians
- Civil Defense
- Journal Club
- Typing

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*In the field of radiation therapy, it is required that at least 10 hours of lectures be given by a radiologist or other qualified instructor This should be supplemented by at least one month of practical training and experience in therapy procedures

NOTE (*a*) All unallotted time during the training period is to be devoted to practice in the subjects listed above, whenever possible (*b*) Group lecture series presented by radiologists, registered technicians or qualified specialists may be applied towards minimum theory hours provided that these lectures are included as an integral part of the training course

2 The course is designed to be presented in approximately 400 teaching hours and should follow a planned outline similar to the *Curriculum and Teacher's Syllabus in X-Ray Technology* (1960) published by the American Society of X-Ray Technicians and approved by the Commission on Technician Affairs of the College of Radiology and the American Registry of X-Ray Technicians The instruction should be accomplished by lectures, discussions or seminars, demonstrations, film critiques, supervised practice, text assignments, and suitable examinations and review It is expected that some instructors will wish to concentrate didactic sessions during the early weeks of training If so, this should be followed by less concentrated but regularly conducted teaching exercises—at least two a week—during the remainder of the two-year training period If not, most teachers have found that one instructional session each day of one or more hour's duration, five days a week, 40 or more weeks a year, is the most effective approach to adequate presentation of material Film critiques may be counted as one of the five weekly teaching exercises It is especially urged that classes be held regularly and on schedule and during the normal day hours of operation of the department

3 Adequate hospital experience should be provided A hospital used for training x-ray technicians should be acceptable to the Council on Medical Education and Hospitals of the American Medical Association

VI Ethics

1 Excessive tuition or other student fees and commercial advertising shall be considered unethical

2 Schools conducted primarily for the purpose of substituting students for paid technicians will not be considered for approval

VII Health

Applicants shall be required to submit evidence of good health and successful vaccination All students shall be given a medical examination, as soon as practicable after admission, by a physician designated by the school This examination shall include a roentgen examination of the chest There shall be adequate periodic medical examination of the student

VIII Method of Application

1 Application for approval of Schools of X-Ray Technology should be submitted to the Council on Medical Education and Hospitals of the American Medical Association, 535 N Dearborn St, Chicago 10, Ill

2 Inquiries regarding registration of qualified x-ray technicians should be addressed to the American Registry of X-Ray Technicians, 2600 Wayzata Blvd, Minneapolis, Minn

Occupational Therapy

Introductory Statement—Since 1933 the Council on Medical Education and Hospitals, at the invitation of the American Occupational Therapy Association, has collaborated with that association in developing and maintaining the highest possible standards for the education of occupational therapists The American Occupational Therapy Association is presently conducting an extensive curriculum study The study, begun in 1958, is to be completed in September 1961 It is anticipated that beneficial recommendations leading to future revisions of curricula will be made at the conclusion of this study

It is essential that an occupational therapist have a broad general collegiate education coordinated with the professional curriculum in occupational therapy and supervised clinical practice in hospitals Both certificate and degree recognition is provided and those so recognized have equal professional status Some institutions also accept students for the certificate program who have graduated with at least three years of training from a nationally accredited school of nursing

Inquiries regarding career opportunities and registration should be addressed to the American Occupational Therapy Association, 250 W 57th St New York 19

Virginia T Kilburn, Director
Department of Education
American Occupational Therapy Association

Statistical Analysis—As of June 30, 1960 there were 29 approved programs of instruction in occupational therapy Fifteen of the institutions offered work in both the degree program and the certificate program, while 14 offered work only in the degree program Enrollment statistics for the academic year 1959 1960 are given in Table 1 The number of graduates for the calendar year 1959 was 463, or 56 less than for 1958

Essentials of an Acceptable School of Occupational Therapy

Prepared by the Council on Medical Education and Hospitals of the American Medical Association

Revised to December 1949

Preamble

The Council on Medical Education and Hospitals of the American Medical Association, the Council on Physical Medicine and Rehabilitation of the American Medical Association and the American Occupational Therapy Association are directly concerned in the training of occupational therapists The Council on Medical Education and Hospitals establishes standards, inspects and approves schools and publishes lists of acceptable schools With the cooperation of the Council on Physical Medicine and Rehabilitation and the American Occupational Therapy Association standards have been established for this type of training for the information of physicians, hospitals, schools, prospective students and others, and for the protection of the public

Therapists are being trained in these schools to work under the direction of qualified physicians and not as independent practitioners of occuptional therapy

I Organization

1 Occupational therapy schools should be established only in medical schools approved by the Council on Medical Education and Hospitals or in colleges and universities affiliated with acceptable hospitals and accredited by the Association of American Universities or the respective regional associations of colleges and secondary schools

2 The schools should be incorporated under the laws regulating nonprofit organizations The control should be vested in a board of trustees composed of public spirited individuals having no financial interest in the operation of the school The trustees should serve for reasonably long and overlapping terms If the choice of trustees is vested in any other body than the board itself, this fact should be clearly stated Officers and faculty of the school should be appointed by the board

TABLE 1 —Data on Enrollment and Graduates American Occupational Therapy Association

	First Year	Second Year	Third Year	Fourth Year*	Certificate*	Total
Fall 1959	401	431	354	683	138	2 007
Spring 1960	3 1	401	346	605	120	1 853

* Include students in clinical affiliations

3 Hospitals are required for clinical practice but should not attempt to operate a school of occupational therapy independently

II Resources

4 Experience has shown that an adequate school of occupational therapy cannot be maintained solely by the income from students fees No occupational therapy school, therefore, should expect to secure approval which does not have a substantial additional income

III Faculty

5 The school of occupational therapy should have a competent teaching staff graded and organized by departments The director of the school should be a qualified occupational therapist whose qualifications are acceptable to the Council on Medical Education and Hospitals, who has had at least three years clinical experience is, registered or eligible for registration and has an academic degree The clinical training in a school of occupational therapy should be under the direction of a physician or a committee of physicians whose qualifications are acceptable to the Council If a committee provides the direction, the chairman should be designated as medical director An advisory committee may also be established including representatives from the departments of the college, university or medical school which participate or cooperate in the teaching of occupational therapy students

IV Plant

6 The physical plant should provide adequate lecture rooms, class laboratories, and administration

Colleges and Universities Offering Approved Courses in Occupational Therapy

Approved by the
Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10
in collaboration with the
Council on Education of the American Occupational Therapy Association

Revised to November 8, 1960
Number of Schools, 29

Name and Location of School	Director and Medical Director or Chm Med Adv Comm	Entrance Requirements	Duration of Course Mo	Classes Begin	Capacity of Final Academic Year	Tuition per Year	Certificate or Degree
College of Medical Evangelists Loma Linda, Calif	Edwinna Marshall Clarence W Dail M D	2 yr college	27	Sept	10	$ 450	Degree
University of Southern California Los Angeles	Harriett F Zlatohlavek John D Walters, M D	Degree	18	Fall	10	1,000	Certificate
		High School	45	Spr Fall	35	1 000	Degree
San Jose State College, San Jose, Calif	Mary D Booth Robert P Quirmbach M D	Degree	18 27	Feb June Sept	50	81[1]	Certificate
		High School	45	Feb, June Sept	#	81[1]	Degree
Colorado State University Fort Collins*	Marjorie Ball Alexander Traill M D	Degree	19	Quarterly	5	210[1]	Certificate
		High School	46	Quarterly	25	210[1]	Degree
University of Illinois College of Medicine Chicago*	Beatrice D Wade Granville A Bennett M D	High School	43	Feb Sept	40	Univ [1]	Degree
Indiana University School of Medicine Indianapolis	Patricia Laurencelle John D Van Nuys M D	High School	46	Feb Sept	20	224[1]	Degree
State University of Iowa Iowa City	Elizabeth Collins Carroll B Larson M D	High School	46	Sept	24	240	Degree
University of Kansas Lawrence	Leland D Miller Donald Rose M D	High School	52	Feb Sept	50	Univ [1]	Degree
Tufts University-Boston School of Occupational Therapy, Boston	Veronica C Dobranske A William Reggio M D	Degree	19	Sept	30	1 050	Certificate
		High School	46	Sept	30	1 050	Degree
Wayne State University Detroit	Barbara Jewett Joseph N Schaeffer, M D	Degree	19	June Sept	30	Univ [1]	Degree
		High School	41	Feb June Sept	#	Univ [1]	Degree
Western Michigan University Kalamazoo	Rosalia A Kiss Maynard M Conrad M D	Degree	18	Sept	20	Univ [1]	Certificate
		High School	41	Sept	50	Univ [1]	Degree
Eastern Michigan University Ypsilanti	Frances Herrick James W Rae M D	High School	45	Feb June Sept	25	215	Degree
University of Minnesota Minneapolis*	Borghild Hansen Frederic J Kottke M D	High School	39	Sept	24	255[1]	Degree
College of St Catherine, St Paul	Sister Mirian Joseph Thomas J Kenyon M D	High School	36	Feb Sept	20	650	Degree
Washington University School of Medicine St Louis	Martha E Matthews Robert E Shank, M D	Degree	18	Sept	16	690	Certificate
		2 yr college	36	Sept	16	690	Degree
University of New Hampshire Durham*	Anne Henderson Charles H Howarth M D	High School	46	Sept	36	380[1]	Degree
University of Buffalo School of Medicine Buffalo	Nancie B Greenman L Maxwell Lockie M D	Degree	18	Sept	12	1 000	Certificate
		High School	45	Feb Sept	15	1,000	Degree
Columbia University College of Physicians and Surgeons, New York City	Marie Louise Franciscus Robert C Darling M D	Degree	18	Sept	20	1 100	Certificate
		2 yr college	27	Sept	15	1 100	Degree
New York University School of Education New York City	Frieda J Behlen	Degree	25	Sept	15	1 480	Certificate
		High School	46	Feb Sept	25	1 480	Degree
University of North Dakota Grand Forks	Amy Lind T H Harwood, M D	High School	36	Feb Sept	12	Univ [1]	Degree
Ohio State University, Columbus	Barbara Locher Donald P Cottrell, Dean	High School	40	Quarterly	30	400[1]	Degree
University of Pennsylvania School of Allied Medical Professions Philadelphia School of Occupational Therapy Philadelphia	Helen S Willard George M Piersol M D	Degree	18	Sept	80	1 100	Certificate
		High School	38	Sept	50	1 200	Degree
Texas Woman's University Denton	Rena C Worthington John S Chapman M D	Degree	36	Sept	15	680	Certificate
		High School	45	Sept	30	680	Degree
Richmond Professional Institute of the College of William and Mary School of Occupational Therapy Richmond Va	H Elizabeth Messick Frederick E Vultee	Degree	18	Sept	20	Univ [1]	Certificate
		High School	45	Sept	20	Univ [1]	Degree
University of Puget Sound School of Occupational Therapy Tacoma, Wash	Elizabeth R Waggoner Robert E Lane M D	1 yr college	23	Jan Sept	30	650	Certificate
		High School	45	Jan, Sept	30	650	Degree
University of Wisconsin Madison	Caroline G Thompson Harry D Bouman M D	High School	46	Jan June Sept	40	Univ [1]	Degree
Milwaukee-Downer College, 2512 E Hartford Avenue Milwaukee	Henrietta McNary Edwin C Welsh M D	Degree	29	Sept	5	800	Certificate
		High School	47	Sept	15	800	Degree
Mount Mary College, 92nd and Burleigh Streets Milwaukee	Sister Mary Arthur Joseph C Griffith M D	High School	45	Sept	20	350	Degree
School of Physical and Occupational Therapy University of Puerto Rico San Juan 22, Puerto Rico	Esteban Lopez Fernandez Robert R King Jr M D	2 yr college	24	Aug	20	None	Degree[3]
		2 yr college	27	Aug	20	None	Degree[3]

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1 Non residents are charged additional fee
2 Master's Degree offered
3 Classes taught in Spanish

* Male as well as female students admitted
# Combined capacity final academic year
N B Schools listed alphabetically by state

offices Equipment should be adequate for efficient teaching in the various departments

7 A library of adequate space and availability and containing standard texts and leading periodicals in occupational therapy should be provided

V Administration

8 *Supervision*—There should be careful and intelligent supervision of the entire school by a director with sufficient authority to maintain the established standards

9 *Records*—There should be systematic records showing credentials, attendance, and grades of the students

10 *Credentials*—The admission of students to occupational therapy schools should be in the hands of a responsible committee or examiner Documentary evidence of the students' preliminary education should be obtained and kept on file

11 *Advanced Standing*—At the discretion of the administration, advanced standing may be granted for work (or experience) required in the occupational therapy curriculum which has been done in other accredited institutions Official verification of previous work (or experience) should be obtained by direct correspondence Preliminary qualifications should also be verified and recorded

12 *Number of Students*—The number of students admitted to the training course should be limited by the facilities of the school

In practical work of a laboratory nature the number of students that can be adequately supervised by a single instructor is in general experience about 15, in lectures the number may be larger A close personal contact between students and members of the teaching staff is essential

13 *Discipline*—Each training school reserves the right to drop a student at any time for any cause which the school authorities deem sufficient

VI Publications

14 The school should issue, at least biennially, a bulletin setting forth the character of the work which it offers Such an announcement should contain a list of the members of the faculty with their respective qualifications

VII Prerequisites for Admission

15 *Education*—Colleges offering training courses in occupational therapy which are combined with work leading to a bachelor's degree should require the candidates for this combined course to comply with the regular entrance requirements of the school concerned Other candidates should furnish proof of having completed one year of college education or its equivalent

16 *Character*—All candidates should be required to present evidence of good character, general fitness, and emotional stability

17 *Health*—All applicants should be required to submit a physical health report including evidence of successful vaccination All students should be given a medical examination under the supervision of the official school physician as soon as practicable after admission and this examination should include a roentgen examination of the chest

VIII Curriculum

18 *Length of Course*—The minimum length of full time training for the course should be 100 weeks The course should include not less than 64 weeks of theoretical and technical instruction and not less than 36 weeks of hospital practice training as set forth in succeeding sections

19 *Distribution of Time*—The period devoted to theoretical and technical training should include not less than 64 semester hours of which not less than 39 semester hours should consist of didactic instruction and not less than 25 hours of technical instruction in therapeutic activities

The curriculum should be so arranged that students placed in hospitals for practical training before the completion of their theoretical and technical instruction should have covered those portions of the curriculum which pertain to the clinical fields to which they may be assigned for practical instruction

(*a*) Theoretical The hours devoted to theoretical training should be still further subdivided as follows

Required Subjects	Semester Hours
(1) Biologic Sciences to include Anatomy Kinesiology Neuroanatomy Physiology Psychology	18
(2) Social Sciences to include Sociology Individual readjustment Social and educational agencies	4
(3) Theory of Occupational Therapy to include Administration General Medicine and Surgery Orthopedics Pediatrics Tuberculosis Psychiatry	8
(4) Clinical Subjects to include General Medical and Surgical Blindness and deafness Cardiac diseases Communicable diseases Neurology Orthopedics Pediatrics Psychiatry Tuberculosis	7
(5) Electives	2
Total	39

(*b*) Technical Because of the increasing demands of the medical profession for qualified therapists trained in special fields applicable to the education and training of disabled persons as well as to the treatment of the sick there should be a certain amount of flexibility in technical requirements

A minimum of 25 semester hours should be devoted to technical training The major portion of these 25 semester hours may be in one of the following fields, with survey courses in other fields

(1) Arts—Fine and Applied
Design, leather, metal, plastics, textiles and wood
(2) Education—Special and Adult
Home economics, and library science
(3) Recreation
Music, dramatics, social activities, gardening and physical education

(*c*) Clinical Training The time for clinical training should be not less than 36 weeks (nine months) No student should be assigned to a clinical training center for less than eight weeks (Rotating assignments may be made within a given center so that the student may have varied experience with different patient groups within the one institution Each of these assignments should be for not less than four weeks) The division of time in the various fields should be as follows

Psychiatric conditions	Not less than 12 weeks
Physical disabilities (surgical, neuromuscular and orthopedic)	Not less than 8 weeks
Tuberculosis	4 to 8 weeks
Pediatrics	4 to 8 weeks
General medicine and surgery (other than physical disabilities)	4 to 8 weeks

IX Hospital Affiliations

20 Hospitals or institutions affiliating for clinical training should be carefully selected by the director of the school in consultation with the medical director No occupational therapy department should be considered for training students unless the director of the department who serves as the instructor is a competent occupational therapist, qualified to supervise students

21 The school, at the beginning of each clinical assignment, should supply the instructor in charge with pertinent information regarding students' education, experience, special abilities and health

22 The instructors in the clinical training departments should be considered members of the extramural staff of the school As such they should be familiar with the content of the school courses pertinent to the particular area of occupational therapy in which students are being trained so that effective correlation of didactic and clinical training may be achieved An outline of the clinical training program should be submitted to the school with which affiliation is maintained

23 Each affiliated institution should have a well defined program to interpret the function of occupational therapy in its own area or type of service, including (*a*) orientation to the program of the institution, (*b*) interpretation of objectives, (*c*) participation in treatment procedure, (*d*) methods of determining progress, evaluation and recording results, (*e*) teaching procedure in technical media most frequently used, (*f*) plan for patients on discharge, and (*g*) organization and administration of the occupational therapy department

There should also be a planned program of lectures, clinics, staff meetings, and conferences to give the student adequate understanding of the medical background and allied professional services in the field or fields in which each institution is concerned

24 Written records of patient progress and case studies should be submitted to the instructor in charge by each student Students must obtain satisfactory rating in clinical training before the diploma is granted

25 Each instructor should maintain records covering the student's personal adjustment and general abilities A report based on these records should be sent to the school on the termination of the student's period of training

X Admission to the Approved List

26 Application for approval of a school of occupational therapy should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N Dearborn St, Chicago 10, Ill Forms will be supplied for this purpose on request They should be completed by the administrator of the institution requesting this approval Inquiries regarding the registration of qualified therapists should be addressed to the American Occupational Therapy Association, 250 W 57th St, New York 19, N Y

27 Approval may be withdrawn whenever in the opinion of the Council a school does not maintain an educational service in accordance with the above standards Whenever a training program has not been in operation for a period of two consecutive years, approval may also be withdrawn

28 Approved schools should notify the Council on Medical Education and Hospitals whenever personnel changes occur in relation to the director or medical director of the school

Physical Therapy

Introductory Statement—The House of Delegates of the American Medical Association in 1936 first adopted a set of standards and essentials for training students in the field of physical therapy These standards were developed through the joint efforts of the Council on Medical Education and Hospitals and the American Physical Therapy Association Since that time, revisions have been adopted and the program is under continual study to insure the maintenance of the highest possible levels of education An Advisory Committee on Physical Therapy Education has been instituted to advise the Council on Medical Education and Hospitals on matters relating to physical therapy This advisory committee consists of nine physician members nominated by national organizations representing the fields of physical medicine and rehabilitation, orthopedic surgery, psychiatry and neurology, internal medicine, pediatrics, general surgery, and medical education In addition, there are three members who are physical therapists, two nominated by the American Physical Therapy Association and one nominated by the American Registry of Physical Therapists The educational consultant of the American Physical Therapy Association attends all meetings of the committee in this capacity Surveys of new and existing schools are conducted by joint physician-therapist teams and recommendatory action submitted by the advisory groups to the Council for action A more active liaison with medical directors, therapist educational administrators, and other members of the teaching faculties in approved schools is being implemented through frequent periodic surveys and consultations

The close alliance of physical therapy to medicine in the care of the patient and in the promotion of health necessitates the development of new schools and improving those schools already training students in physical therapy Recruiting for this necessary area is of vital importance to the medical profession

Sarah S Rogers, Consultant
Department of Professional Education
American Physical Therapy Association

Statistical Analysis—As of June 30, 1960 there were 40 institutions in the United States and Puerto Rico offering approved courses in physical therapy Nineteen institutions offered work in both the degree and certificate programs, while seven offered certificate programs only and fourteen offered only degree programs A list of these programs is given below It can be noted that the length of the training period varies in the several institutions based on the educational aims of the particular university and the level of education required for admission to the physical therapy program In general, a high school graduate can complete the professional and degree requirements in four years and a student having completed the baccalaureate degree can satisfy the professional or clinical requirements in 12 or 14 months In the latter instance, a student satisfactorily completing the program would be awarded a certificate of proficiency

On the basis of data reported to the American Physical Therapy Association, enrollment statistics for the senior class degree programs and for the certificate programs, and the number of graduates for 1959 together with similar information on the two previous years is given in Table 2 Enrollment at the senior and certificate level was 6% higher than in 1958 The number of graduates, however, was 58 less than the previous year reflecting the drop in enrollment reported for 1958

From the information given in the list of approved programs, it can be noted that, in addition to the length of the program, universities vary in the amount of tuition and fees and in the beginning dates of the programs Interested students should write directly to the institution of their choice regarding the details of enrollment Inquiries regarding careers and opportunities in the field of physical therapy should be addressed to the American Physical Therapy Association, 1790 Broadway, New York 19

Application for approval of a program of training in physical therapy should be made to the Council on Medical Education and Hospitals of the American Medical Association Forms will be sent for this purpose on request and are to be completed by the administrator of the institution requesting approval

Inquiries regarding voluntary registration of qualified physical therapists should be addressed to the American Registry of Physical Therapists, 30 N Michigan Ave , Chicago 2 Information on requirements for state registration or licensure is available from the State's Board of Examiners

Essentials of An Acceptable School of Physical Therapy

Prepared by the Council on Medical Education and Hospitals of the American Medical Association
Revised to December 1, 1955

Preamble

The Council on Medical Education and Hospitals of the American Medical Association, in collaboration with its Advisory Committee on Physical Therapy Education, the American Physical Therapy Association, and such other bodies as may be deemed desirable establishes standards of physical therapy education, inspects and approves educational programs for students in physical therapy, and publishes lists of those which are acceptable for the information of physicians, hospitals, col-

Approved Schools of Physical Therapy

Approved by the
Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10

in collaboration with the
Council on Education of the
American Physical Therapy Association

Revised to November 8, 1960
Number of Schools, 40

Schools should be contacted directly for specific and detailed information

Name and Location of School	Medical Director and Educational Administrator	Duration of Course	Class Begins	Capacity of Final Academic Year	Tuition	Certificate** or Degree
Army Medical Service (Address all inquiries to the Office of the Surgeon General, Department of the Army Washington 25, D C)						
Army Medical Service School Fort Sam Houston (San Antonio) Texas with selected Army Hospital Affiliations	Lt Col George F Kumer M C Lt Col Elizabeth J Davies AMSC	12 mo	Sept	24	None	Certificate
Non federal						
Children's Hospital, Los Angeles Calif	Samuel S Mathews M D Mary J Dodge	14 mo	Sept	16	$500	Certificate
College of Medical Evangelists, Loma Linda Calif	Fred B Moor, M D Ronald A Hershey	2 yr †	Sept	32	835	Degree
University of Southern California, Los Angeles Calif	Charles L Lowman M D Tracy Streyey Ph D	13 mo	Sept	32	1 050	Certificate
University of California School of Medicine, San Francisco Calif	Margaret S Rood	41 mo	Feb Sept	16	500 sem	Degree
Stanford University, Palo Alto, Calif	Gregory Bard M D Margery L Wagner	12 mo 12 mo	Sept Sept	25 ‡	1 500[1] 1 500[1]	Certificate Degree
University of Colorado School of Medicine Denver, Colo *	William H Northway M D Lucille Daniels	12 mo 41 mo	Sept Sept	32 ‡	983 983	Certificate Degree
University of Connecticut, Storrs, Conn	Jerome W Gersten M D Dorothy G Hoag	12½ mo 4 yr	Sept Sept	20 ‡	208[1] 706[1]	Certificate Degree
Northwestern University Medical School Chicago * Ill	John C Allen M D Frances Tappan	4 yr	Feb Sept	100	Univ [1]	Degree
Indiana University School of Medicine Indianapolis Ind	Ben L Boynton M D Elizabeth C Wood	12 mo ‡ 12 mo ‡	Sept Sept	26 ‡	1 000 1 000	Certificate Degree
State University of Iowa Iowa City, Iowa	John D Van Nuys M D Frances C Ekstam	4 yr	Sept	20	224 yr[1]	Degree
University of Kansas Medical Center, Kansas City Kans	W D Paul M D Olive C Farr	12 mo	Sept	25	260	Certificate
University of Maryland School of Medicine, Baltimore Md	Donald L Rose M D Ruth G Monteith	12 mo 4 yr	Feb Sept Feb Sept	40 ‡	70 sem[1] 70 sem[1]	Certificate Degree
Simmons College Boston, Mass	Paul F Richardson M D Gladys E Wadsworth	39 mo	Sept	16	270 yr	Degree
Boston University Sargent College, Boston, Mass	William T Green, M D Arthur L Watkins M D Shirley M Cogland	16 mo 4½ yr	Sept Sept	16 ‡	1,170 3 870	Certificate Degree
Bouvé Boston School (in affiliation with Tufts University) Medford Mass	Kenneth Christophe M D Adelaide L McGarrett	12 mo 4 yr	Sept Sept	10 40	1,750 1 100	Certificate Degree
University of Michigan, Ann Arbor, Mich	Heinrich G Brugsch, M D Constance K Greene	38 mo	Sept	40	1,100 yr	Degree
University of Minnesota, Minneapolis Minn	James W Rae, Jr M D Virginia Wilson	15 mo 4 yr	June Sept	18 ‡	440[1] 1 280[1]	Certificate Degree
Mayo Clinic, Rochester, Minn	Frederic J Kottke M D Wilbur L Moen	4 yr	Sept	24	1 145[1]	Degree
St Louis University, Division of Health and Hospital Services, St Louis Mo	Earl C Elkins M D Dale A Shaffer	24 mo	Sept	35	None[4]	Certificate
Washington University School of Medicine, St Louis Mo	D E O'Reilly M D Sister Mary Imelda	4 yr	Feb Sept	20	400 sem	Degree
Russell Sage College—Albany Medical College Division of Physical Therapy, Albany, N Y	Robert E Shank M D Beatrice F Schulz	2 yr † 4 yr	Sept Sept	14 ‡	1 200 3 000	Degree Degree
University of Buffalo, Buffalo N Y	Leonard D Policoff M D Dorothy L McLaughlin	12 mo 40 mo	Sept Sept	20 ‡	800 1 000	Certificate Degree
Ithaca College Albert Einstein College of Medicine Ithaca New York, N Y	L Maxwell Lockie M D Mildred F Heap	15 mo 4 yr	Feb July Sept Sept	10 20	500 sem 500 sem	Certificate Degree
Columbia University College of Physicians and Surgeons New York, N Y	Arthur S Abramson M D A Garman Dingwall	27 mo 12 mo	 Sept	 30	800 980	 Degree
New York University (School of Education) New York, N Y	Robert C Darling, M D Mary E Callahan	12 mo 2 yr	Sept Sept	15-20 ‡	1 100 yr 1 100 yr	Certificate Degree
Duke University School of Medicine, Durham, N C	John J Untereker M D Elizabeth C Addoms	12 mo 36 mo	Sept Feb Sept	20 20	1 520 5 120	Certificate Degree
University of North Carolina School of Medicine, Chapel Hill, North Carolina	Lenox D Baker M D Helen Kaiser	15 mo 15 mo	Sept Sept	16 ‡	650 950	Certificate Degree[3]
Frank E Bunts Educational Institute Cleveland, Ohio	William P Richardson M D Margaret L Moore	39 mo †	Sept	24	350[1]	Degree
Ohio State University University Hospital Columbus, Ohio	Paul A Nelson M D Robert D Kruse	14 mo-	Sept	18	300	Certificate
University of Oklahoma, Oklahoma City and Norman, Okla	R D Burk M D Gladys G Woods	12 mo 4 yr	Sept Sept	20 ‡	Univ [1] Univ [1]	Certificate Degree
	W K West M D Thelma Pedersen	4 yr	Sept	20	834[1]	Degree

Name and Location of School	Medical Director and Educational Administrator	Duration of Course	Class Begins	Capacity Of Final Academic Year	Tuition	Certificate** or Degree
D T Watson School of Physiatrics Division of Physical Therapy Leetsdale Pennsylvania (affiliated with University of Pittsburgh)	Jessie Wright M D	12 mo	Oct	30	500	Certificate
	Kathryn L Kelley	4 yr ‡	Sept	±	3 404	Degree
Division of Physical Therapy School of Allied Medical Professions University of Pennsylvania Philadelphia Pa	William T Erdman II M D	12 mo	Sept	40	1,100	Certificate
	Dorothy F Baethke	40 mo	Feb Sept	25	1 200	Degree
Grady Vaughn School of Physical Therapy Baylor University Medical Center Dallas Tex	Edward M Krusen M D	15 mo	Sept	16	300	Certificate
	Doris E Porter	42 mo	Sept	±	Univ ¹	Degree
University of Texas Medical Branch Galveston Tex	G W N Eggers M D	12 mo	Jan	12	110	Certificate
	Ruby Decker	12 mo	Jan	±	110	Degree
Hermann School of Physical Therapy Hermann Hospital Houston Tex	Oscar O Selke Jr M D	12 mo	Oct	35	375	Certificate
	Cecelia I Lee	12 mo ‡	Oct	±	375	Degree
Medical College of Virginia Richmond Va	Frederick F Vultee M D Susanne Hirt	2 yr	Sept	30	500¹	Degree
University of Wisconsin Medical School Madison Wis	H D Bouman M D Margaret A Kohli	4 yr	Feb Sept		Univ ¹	Degree
Marquette University School of Medicine Milwaukee Wis	Ray Piaskoski M D Beth I Phillip	4 yr	Sept	20	3 200	Degree
School of Physical and Occupational Therapy University of Puerto Rico San Juan 22 Puerto Rico	Robert R King Jr M D	4 yr	Aug	20	None	Degree³
	Lutgarda V de Pineiro	5 yr	Aug	20	None	Degree³

1 Nonresidents charged additional fee
2 Master's degree offered
3 Classes taught in Spanish
4 Students paid a stipend

† Follows two years of college
‡ Follows three years of affiliated college
* No male students admitted
± Combined capacity final academic year
** 2 to 4 years of college work required for admission

leges, and universities, prospective students, and for the protection of the public

These standards are designated as a guide to provide an effective educational basis for the practice of physical therapy Therapists should be trained in these schools to work under the direction of qualified physicians and not to practice independently

It is desirable that the preliminary education of the physical therapist include the study of the humanities, social, biological and physical sciences It is recommended that the educational programs be established in accordance with the following general principles

I Organization and Administration

1 Educational programs may be established in colleges and universities accredited by their respective regional associations and associated with medical schools or hospitals acceptable to the Council on Medical Education and Hospitals

Physical therapy teaching programs of no less than 12 months may be established in hospitals acceptable to the Council on Medical Education and Hospitals for students whose education meets the requirements indicated in item 19

2 Financing of the educational program should not depend solely upon student tuition fees but should be assured through stated university or hospital budgets, gifts, or endowments

3 A physician who is a physiatrist or other physician whose qualifications are acceptable to the Council on Medical Education and Hospitals shall be responsible for the organization, periodic review, continued development and general effectiveness of the educational program These functions shall be carried out after consultation with the educational administrator and in accord with the established policies of the institution or institutions concerned Schools may wish to appoint a medical advisory committee to assist in formulating these policies

A qualified physical therapist, who functions as educational administrator, shall administer the program with the advice and approval of those responsible for the educational program

4 A bulletin describing the curriculum should be issued at least biennially It should include information regarding the organization of the program and a listing of required courses, names and academic rank of faculty, entrance requirements, tuition and fees, and information concerning hospitals and facilities used for clinical experience

5 In colleges and universities, selection of students should be made by the admissions office in cooperation with those responsible for the educational program Similarly in hospitals, selection of students should be made by an admissions committee in cooperation with those responsible for the educational program Admission data should be on file and open for review by appropriate accrediting bodies

6 A record of class participation and accomplishment of each student should be kept in accordance with college, university, or hospital requirements A detailed analysis of the clinical experience of each student should be on file

7 The ratio of students to instructors in physical therapy procedures should be not more than 20 to 1 in laboratory classes, 2 to 1 in initial directed clinical experience, and 4 to 1 in subsequent directed clinical experience

II Services and Facilities

8 A student health service should be available for evaluation and maintenance of mental and physical health

9 A counseling service should be available for student guidance

10 Library facilities should be readily accessible and should contain an adequate supply of books, periodicals and other reference materials related to the curriculum

11 Appropriate equipment and laboratory supplies should be provided in sufficient quantities for demonstration and student participation in laboratory courses Classroom facilities should be available for student laboratory practice in physical therapy Charts, models, slides, films, specimens and other appropriate teaching aids should be provided

12 Clinical training and experience should be only in physical therapy departments which are under the direction of physicians whose qualifications are acceptable to the Council on Medical Education and Hospitals These departments of physical therapy should be in institutions or agencies which have sufficient patient loads, qualified physical therapy personnel, and adequate equipment to provide the type and amount of experience for which the student is assigned Students should not be sent to private offices of physicians for clinical practice

13 A department (or departments) of physical therapy should be designated as the primary clinical teaching unit for patient demonstration, student observation, and initial directed clinical experience The clinical material provided by such a unit (or units) should embrace a broad cross section of physical and functional disorders for which a wide variety of physical therapy procedures are utilized

III Faculty

14 The instructional staff should be qualified through academic preparation and experience to teach the subject (or subjects) assigned The question of full-time and part-time appointments is not so important as the qualifications of the instructors

15 The qualifications of the physician or physicians responsible for the educational program should be acceptable to the Council on Medical Education and Hospitals

16 The physical therapist who administers the educational program should have the following qualifications completion of a physical therapy curriculum approved by the Council on Medical Education and Hospitals of the American Medical Association or has equivalent qualifications which are acceptable to the Council, and ordinarily a minimum of five years' of clinical and teaching experience in physical therapy of which at least three years should be clinical A bachelor's degree or its equivalent in experience and demonstrated competence is required Full time should be devoted to the development of the program

17 The instructional staff shall include at least one other qualified physical therapist who has had adequate clinical experience, or the equivalent of such a full-time instructor shared by two appointees

18 In each clinical center the students' supervisors should be qualified physical therapists with adequate clinical experience in the generalized or specialized area of physical therapy to which the students are assigned

IV Educational Program

19 *Admission Requirements*—Accredited collegiate training in preparation for the study of physical therapy should provide the opportunity for a good general education The minimum admission requirements to the professional curriculum which will qualify a student for a certificate in physical therapy are two years of collegiate training or graduation from a nationally accredited professional school of nursing of no less than three years' duration Collegiate preparation of three years' duration is encouraged

When preparatory training is properly integrated with professional training in a collegiate school of physical therapy, such training will lead to a baccalaureate degree in physical therapy

In all instances preparatory courses in the biological and physical sciences are required Instruction in physics, chemistry, and psychology is recommended and, as in any professional career, a broad educational background including studies in the social sciences and humanities is desirable

It is desirable that qualitative standards with reference to academic performance, character, motivation and health be applied to candidates for admission

20 *Professional Curriculum* —The following curriculum is intended as a guide The individual schools should feel at liberty to recombine these materials into courses with titles which fit their plan of administration so long as all the subject matter is covered including directed clinical experience Continuous study of the curriculum by the faculty with the introduction of modification and new methods and materials to take proper cognizance of advances and changing conditions is essential in the conduct of an acceptable school of physical therapy

The curriculum should extend over a minimum of 12 months and provide adequate instruction in the following

	Semester Credits	Clock Hours
Anatomy	6	210

Human Lectures, demonstrations, and laboratory on the structure of the human body with major emphasis on the topographical, skeletal and neuromuscular aspects Cadavers for dissection or prosected specimens and skeletons are essential for this teaching

Applied Lectures demonstrations and laboratory to emphasize the principles of movement in the human body Analysis and applications of these principles

Physiology 6 150

General Lectures, demonstrations and laboratory on the basic physiological principles governing the functions of the living body General physiology may be required by an individual school prior to the entry to the certificate program If so it need not be repeated

Applied Lectures, demonstrations and laboratory emphasizing the physiological effects of physical therapy procedures on the human body

Pathology 2 30

Lectures, and demonstrations on the pathological conditions which exist in disease and injury Special emphasis on the *pathology of the skeletal neuromuscular and circulatory* system

Psychology 1 15

Correlation of concepts of personality development with major emphasis on psychological dysfunctions affecting sick and disabled persons

Clinical Medicine 6 90

Lectures covering the various areas of medicine and surgery emphasizing conditions commonly encountered in patients treated by the physical therapist, including reference to the reasons for the use of the various treatment procedures clinical demonstrations of the diseases, and disabilities studied

Tests and Measurements 3 105

Lectures demonstrations and laboratory practice in electrical manual, and other procedures for evaluation of normal or pathological conditions in terms of

(1) physical achievement
(2) body measurements
(3) postural patterns
(4) physiological function

Instruction in

(1) use of instruments
(2) interpretation of test results
(3) recording of data

Therapeutic Exercise and Assistive Devices 6 210

Lecture and demonstrations on the principles, indications physical, and physiological bases for the prevention and correction of disabilities through the use of

(1) individual and group exercises
(2) functional activities, including ambulation
(3) assistive devices such as splints, braces, prostheses, and exercise apparatus
(4) test and measurement findings in planning therapeutic exercise programs

Laboratory practice for proficiency

Physical Agents 5 165

Lectures on the principles, indications physical and physiological bases for the use of agents, including

(1) heat and cold
(2) light
(3) water
(4) massage
(5) electricity

Laboratory practice for proficiency in their utilization

History, Administration and Professional Relationships 2 30

Historical background, present practices and trends of the profession

Physical plant and equipment program organization, personnel management and employment practices Function, preparation and use of records, reports and statistical analyses

Coordination of the program in the treatment center and in the home and with other services in the community concerned with patient care

Ethical conduct in relationships with patients, lay and professional co-workers and the institutions and agencies participating in patient care

Clinical Experience 8 600

A supervised learning experience through which the student acquires understanding and skill in physical therapy procedures, learns to deal with the patient's emotional and mental problems, accepts responsibilities as a participating staff member aware of the need for adherence to medical ethics in all relationships, recognizes the contribution of and learns to work with other professional and nonprofessional personnel in attaining the objectives of the treatment plan prescribed by the physician

Assignments for directed clinical experience should be made to departments which conform to standards set forth in item 12 No more than 25 per cent of the total experience should be spent in a single specialized area The student's assignments should be so rotated that experience is gained in the treatment of patients of all age groups with diseases and disabilities previously studied didactically and in the laboratory One full assignment of 150 clock hours is strongly recommended

It should be emphasized again that the above curriculum outline constitutes not absolute requirements, but provides a guide for the organization of the educational program

It is recognized that the value of semester credits varies from school, to school particularly in regard to laboratory and clinical work The following scale does not imply that a school must grant the exact number of semester credits stated in these standards so long as the approximate equivalent in clock hours of work is given

1 semester credit equals 15 lecture hours
1 semester credit equals 45 laboratory hours
1 semester credit equals 75 directed clinical experience hours
1 quarter credit equals 10 lecture hours
1 quarter credit equals 30 laboratory hours
1 quarter credit equals 50 directed clinical experience hours

V Admission to the Approved List

21 Application for approval of physical therapy schools should be made to the Council on Medical Education and Hospitals, American Medical Association, 535 N Dearborn St, Chicago 10, Ill Forms will be supplied for this purpose on request

22 Approval may be withdrawn whenever in the opinion of the Council a school does not maintain an educational service in accordance with the above standards Whenever a training program has not been in operation for a period of two consecutive years, approval may also be withdrawn

23 Approved schools should notify the Council on Medical Education and Hospitals whenever per-

sonnel changes occur in relation to the administration of the school

VI General Information

24 Inquiries regarding voluntary registration of qualified physical therapists should be addressed to the American Registry of Physical Therapists, 30 N Michigan Ave, Chicago 2, Ill

25 Inquiries regarding requirements for state registration or licensure should be addressed to the Board of Examiners of the states concerned

26 Inquiries regarding careers in the field of physical therapy should be addressed to the American Physical Therapy Association, 1790 Broadway, New York 19, N Y

TABLE 2 —Data on Enrollment and Graduates, American Physical Therapy Association

Year and Class		Schools Reporting No	Senior (Degree) and Certificate Students Enrolled No	Total Graduates No
1957	Senior	14	798	750
	Certificate	30		
1958	Senior	31	676	718
	Certificate	27		
1959	Senior	33	716	660
	Certificate	25		

Medical Record Library Science

Introductory Statement —The American Medical Association, through its Council on Medical Education and Hospitals, has worked closely since 1942 with the American Association of Medical Record Librarians and its Committee on Education and Registration, to establish standards and promote development of two types of educational programs for medical record personnel—the professional educational programs for medical record librarians and the technical educational programs for medical record technicians

The educational programs for medical record librarians are of two types—certificate programs and baccalaureate programs The certificate programs are 12 months in length, and have as a minimal entrance requirement, two years of college work or graduation from an accredited school of professional nursing

The Essentials of an Acceptable School for Medical Record Librarians were recently revised by the American Association of Medical Record Librarians, in collaboration with the Council on Medical Education and Hospitals, and were approved by the House of Delegates of the American Medical Association in June, 1960 These changes in the essentials reflect the findings and recommendations of a 1957 research project conducted by a study group of the Graduate School of Public Health, University of Pittsburgh, on 'Functions and Education of Medical Record Personnel" The Pittsburgh study indicated that the most satisfactory educational program for medical record librarians is one that includes a solid base of liberal arts subjects to which is added professional medical record science courses The main areas of change in the 'Essentials for an Acceptable School for Medical Record Librarians' are in the professional curriculum, and incorporate increased time for theoretical instruction and laboratory projects, a reduction in the number of clock hours of practical work experience, and emphasis on professional and scientific courses that could be shared by students in other health professions—so-called 'core courses The revisions in the essentials will facilitate the introduction of the professional curriculum in medical record library science into the programs of colleges and universities generally, and particularly those institutions in which there are already established programs for other professional personnel in fields allied to medicine

The development of increased numbers of baccalaureate programs for medical record librarians, in accredited colleges and universities, is seen as a possible solution to the present problem of an insufficient number of qualified professional medical record librarians to serve the medical care facilities of this country

The "Essentials for the Training of Medical Record Technicians' were approved by the American Association of Medical Record Librarians and the American Medical Association in 1953 Medical record technicians work under the supervision of qualified medical record librarians or under a medical record committee, performing the technical tasks associated with the maintenance and custody of medical records Courses in medical record technology are open to qualified high school graduates, and are conducted in approved hospital schools Courses are 9 to 10 months in duration

Inquiries on career opportunities for medical record librarians and medical record technicians should be addressed to the American Association of Medical Record Librarians, 840 North Lake Shore Drive, Chicago 11, Illinois

Laura Anne Biglow, RRL
Chief, Education Program
American Association of Medical Record Librarians

ANGEL OF BETHESDA

The first general treatise on medicine written by an American was Mather's "Angel of Bethesda" (1724) The work nicely illustrates transatlantic contacts, since Mather drew on much of the medical literature of his day in either Latin or English versions The study also illustrates most of the issues which were then current in European thought or which had been current in the author's youth One wonders whether, since these matters were so assimilated in one American's thinking, they had not penetrated—if in lesser degree—into the minds of others? This surmise is more plausible because of the fact that Mather was one of the few Americans here considered who never lived abroad Most of the sources and contacts he employed were available to any thoughtful Bostonian

The "Angel of Bethesda" is unique among American works in providing a complex blend of medicine and theology In that respect it reflected a clergyman's outlook and was reminiscent of the preceding century Disease, Mather held, was ultimately caused by sin and was to be cured by prayer and forgiveness But religious reasons were found for seeking scientific aid as well, and these opened the door to the author's obvious concern with medicine —R H Shryock, Medicine and Society in America, 1660-1860, New York University Press, 1960, pages 54 and 55

Medical Record Librarians

Statistical Analysis—On June 30, 1960, there were 29 approved schools for medical record librarians Student enrollment increased in 1959 to 180 students, a 6 5% increase over the 1958 enrollment in the senior class of degree programs and in certificate programs There was a training capacity for 253 students in the approved schools Accordingly, the occupancy rate was 66% for the senior class in nine degree programs with senior students in 1959 and 72% in the 21 active certificate programs The number of graduates in 1959 from the degree programs was 49 and 94 from the certificate program This total of 143 graduates represents a 47% increase over last year s figure The figure for 1959 is almost the same as for the number of graduates in 1957

During the year, one school became inactive and one school was reactivated, thereby keeping the total number of schools unchanged

Hospitals and colleges interested in seeking approval of schools for Medical Record Librarians should apply to the Council on Medical Education and Hospitals of the American Medical Association Special forms will be supplied for this purpose, and, when the required information has been received, the proposed training program will be reviewed in collaboration with the Committee on Education and Registration of the American Association of Medical Record Librarians The institutions applying for Council approval will, in all instances, receive full information and every possible assistance in the planning and development of training programs in accordance with current standards There continues to be a shortage of qualified medical record librarians and excellent opportunities exist for graduates

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Complete, accurate, and available medical records make possible the scientific evaluation of medical care This fact alone is ample evidence of the importance of the work of a competent medical record librarian This is not the boundary, however, since future scientific endeavors can be reflected from these carefully noted events in the patients history, findings and course of therapy Each record is critical not only for the moment but also for a time yet to be determined Study the past to understand the future

Essentials of An Acceptable School for Medical Record Librarians

Prepared by the Council on Medical Education and Hospitals of the American Medical Association

Revised to June 16, 1960

Preamble

The Council on Medical Education and Hospitals of the American Medical Association, in collaboration with the Committee on Education and Registration of the American Association of Medical Record Librarians and such other bodies as may be deemed desirable, establishes standards for medical record science education, surveys and approves educational programs for students in medical record science, and publishes lists of those programs which are acceptable for the information of hospitals, colleges and universities, medical schools, physicians, prospective students, and for the protection of the public

These standards are to be used as a guide for the development of an effective educational program for the practice of medical record science It is desirable that the pre-professional education of the medical record librarian include the study of the humanities, social, biological, and physical sciences The general principles to be followed in the establishment of educational programs for medical record librarians, as outlined in the following sections, should be observed

I Organization and Administration

1 Educational programs may be established in colleges and universities accredited by their respective regional associations, provided that hospitals suitable for directed experience are available Educational programs of no less than the equivalent of 12 months study may also be established in hospitals for students whose education meets the requirements outlined in Item 18 Hospitals involved in educational programs should be acceptable to the Council on Medical Education and Hospitals and should be accredited by the Joint Commission on Accreditation of Hospitals

2 Financing of the educational program should not depend solely upon student tuition fees but should be assured through stated university or hospital budgets, gifts or endowments in the same proportion as other educational programs sponsored by the organization

3 The director of the program, whose qualifications are acceptable to the Council on Medical Education and Hospitals shall be responsible for the organization and administration, periodic review, continued development, and general effectiveness of the educational program In carrying out these functions, he shall be guided by the standards set forth in these Essentials, and by the established policies of the institution or institutions concerned Schools may wish to appoint an advisory committee to assist in formulating these policies

4 A bulletin describing the curriculum should be issued at least biennially It should include information regarding the organization of the program and a listing of required courses, names and academic

Approved Schools for Medical Record Librarians

Approved by the
Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10
in collaboration with the
Committee on Education and Registration of the
American Association of Medical Record Librarians

Revised to November 8, 1960
Number of Schools, 29

Name and Location of School	College Affiliation	Director	Entrance Requirements	Duration of Course Mo	Classes Begin	Student Capacity	Tuition
*Herrick Memorial Hospital, Berkeley, Calif	†Mills College	Florence K Tryhus	2 yr college or R N	12	June	6	$300
*Samuel Merritt Hospital, Oakland, Calif	†Univ of Calif at L A	Paul A Lembcke, M D	High school	4 yr	Sept		Univ
*University of California at Los Angeles Calif	Mills College	Shirley R Sillineri	2 yr college or R N	12	Sept	6	300
*Emory University, Atlanta, Ga	Emory University	Betty Ramsden	2 yr college	12	Sept	9	250
*Grant Hospital Chicago, Ill	Northwestern University	Marguerite Twedt	2 yr college or R N	12	Sept	8	325[2]
St Elizabeth Hospital, Danville, Ill	*Danville Junior College*	Sister Mary Regina	2 yr college or R N	12	Sept	8	325
*Indiana University Medical Center, Indianapolis, Ind	†*Indiana University*	Gertrude L Gunn	High school	4 yr	Sept	10	Univ
*University of Louisville Medical Center Louisville, Ky	University of Louisville	Norma C McMahan	2 yr college or R N	12	Sept	6	300
*U S Public Health Service Hospital Baltimore Md		M Loyola Voelker	Degree	12	Sept	10	None
Massachusetts General Hospital, Boston Mass	†Simmons College, Boston †Colby Jr College, New London N H †Rosary Hill College Buffalo N Y	Mary F Converse	3 yr college	12	June	13	300
Mercy College, Detroit Mich	†Mercy College	Sister Marie Bernard	High school	4 yr	Sept	6	500 yr
College of St Scholastica Duluth Minn	†College of St Scholastica	Sister Mary Loretta	High school	4 yr	June	12	400 yr
University Hospital, Jackson Miss		Margaret E O Connell	2 yr college or R N	12	Sept	6	None
St Joseph Hospital, Kansas City, Mo	†College of St Teresa	Sister Mary Fatima	High school	4 yr	June	4	Univ
*Homer G Phillips Hospital, St Louis Mo		Esther M Sherard	2 yr college or R N	12	Sept	12	250
*St Louis University St Louis Mo	†St Louis University	Sister Mary Servatia	High School	4 yr	June Sept	16	Univ
St Catherine s Hospital, Omaha Neb	†College of St Mary	Sister Mary Eugene	2 yr college or R N	12	Sept	12	Univ
*Lutheran Medical Center, Brooklyn N Y	Long Island University	Lena Ann Fekete	2 yr college or R N	12	Sept	4	350
*St Mary s Hospital Brooklyn N Y		Sister Mary Laurentia	2 yr college or R N	12	Sept	8	350
*North Carolina Baptist Hospital Winston Salem, N C	Wake Forest College	Betty Hennessee	2 yr college or R N	12	June	12	200
*Hillcrest Medical Center, Tulsa Okla		Olive M Stivale	2 yr college or R N	12	Oct	4	250
Graduate Hospital University of Pennsylvania, Philadelphia, Pa	University of Pennsylvania	Gertrude Hanauer	Degree	12	Sept	8	300
Mercy Hospital Pittsburgh, Pa	†Mt Mercy College †Duquesne University	Sister M Alicia	High school	4 yr	Sept	6	Univ
*Baptist Memorial Hospital, Memphis, Tenn	University of Tennessee	Virginia Hamilton	2 yr college or R N	12	Sept	8	150
*St Joseph s Hospital, Houston Tex	Sacred Heart Dominican College	Sister Mary Pauline	2 yr college or R N	12	Sept	10	150
*Santa Rosa Hospital, San Antonio Tex	†Incarnate Word College	Sister M Benignus	High school	4 yr	Sept	6	Univ
*Providence Hospital, Seattle Wash	†‡Seattle University	Sister Peter Olivant	2 yr college H S	1½ yr	June	10	150
St Francis Hospital, LaCrosse Wis	Viterbo College	Sister M Petrone	2 yr college or R N	12	Sept	4	125
*Bayamon District Hospital Bayamon Puerto Rico	University of Puerto Rico	Cruz C Garcia Stannard	Degree	12	Aug	10	None[1]

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* Male as well as female students admitted
† Degree offered
‡ Degree course also available
1 Scholarships available
2 School is inactive

rank of faculty, entrance requirements, tuition, and fees, and information concerning hospitals and facilities used for directed practice experience

5 In colleges and universities, selection of students should be made by the admissions office in cooperation with those responsible for the educational program in accordance with the generally accepted practice of the school In hospital sponsored programs, selection of students should be made by an admissions committee in cooperation with those responsible for the educational program Admissions data should be on file at all times in colleges, universities or hospitals sponsoring the program

6 A record of class participation and accomplishment of each student should be kept in accordance with the college, university or hospital requirements A detailed analysis of the directed practice and laboratory experience, or both, of each student should be on file

7 Copies of the course outlines, class schedules, directed practice schedules, and teaching plans should be on file in colleges, universities, and hospitals, and open for review

II Services and Facilities

8 A student health service should be available for evaluation and maintenance of mental and physical health

9 A counseling service should be available for student guidance

10 Library facilities should be readily accessible and should contain an adequate supply of books, periodicals and other reference materials related to the curriculum

11 Appropriate equipment and directed practice supplies should be provided in sufficient quantities for demonstration and student participation Classroom facilities should be available Charts, models, slides, films, sample files, specimens, and other appropriate teaching aids should be provided

12 A medical record department (or departments) should be designated as the primary teaching unit for demonstration, student observation, and initial directed practice experience The directed practice material provided in the primary teaching unit should include functions and standards of procedure of sufficient scope to illustrate the generally accepted principles of medical record practice

13 In addition to the medical record department (or departments) designated as the primary directed practice teaching unit, directed practice experience may be provided in medical record departments which are under the direction of medical record librarians whose qualifications are acceptable to the Council on Medical Education and Hospitals These medical record departments should be in institutions or agencies which have sufficient qualified, experienced medical record personnel, adequate equipment and directed practice material to provide the type and amount of experience for which the student is assigned

III Faculty

14 The instructional staff should be qualified through academic preparation and experience to teach the subject (or subjects) assigned

15 The director of the program should have the following qualifications

(*a*) A baccalaureate degree, registration or eligibility for registration, and three years of experience in the general practice of medical record science

OR

(*b*) Other appropriate educational qualifications and experience

16 The instructional staff should include one or more qualified medical record librarians Sufficient staff should be available to instruct, counsel and supervise in the various facets of the educational program The student-instructional staff ratio should at least be in the same proportion as similar education programs sponsored by the organization sponsoring the school

17 In each directed practice area, there should be qualified personnel with adequate experience in the generalized or specialized area of medical record practice to which the students are assigned under the general direction of the director of the program

IV Educational Program

18 *Admission Requirements*—Accredited collegiate preparation for the study of medical record science should provide the opportunity for a good general education The minimum admission requirements to the professional curriculum that will qualify a student for a certificate in medical record science are

a the completion of 60 semester hours or 90 quarter hours of credit in a regionally accredited college or university, with a distribution of these credits in the areas of the natural sciences including human anatomy and physiology, fine arts language and literature mathematics social science, philosophy, and religion,

OR

b graduation from a professional school of nursing recognized by a state board of nurse examiners evaluated as or supplemented by general education to the equivalent of 60 semester hours or 90 quarters of credit in a regionally accredited institution

Collegiate preparation of three years' duration is encouraged When preparatory education is properly integrated with the professional curriculum in a collegiate school of medical record science, such education may lead to a baccalaureate degree in medical record science

19 *Professional Curriculum*—The following curriculum is intended primarily as a guide The individual schools should feel at liberty to recombine

these materials into courses with titles which fit their plan of administration so long as all the subject matter is covered, including directed practice experience Continuous study of the curriculum by the faculty with the introduction of modifications, new methods and materials to take proper cognizance of advances and changing conditions is essential to the proper growth and development of an acceptable school for medical record librarians The professional curriculum should extend over a minimum of the equivalent of 12 months' study and provide adequate instruction in the following

Fundamentals of Medical Science—Four semester hours (72 clock hours)

A study of the fundamentals of medical science and medical essentials presented through doctors' lectures in the medical specialties

Medical Terminology—Two semester hours (36 clock hours)

A study of terms related to all areas of medical science, hospital service, and the paramedical specialties

Medical Record Science—Eight semester hours lecture (144 clock hours), 4 semester hours laboratory (144 clock hours)

A study of the history of medical records, report preparation, quantitative analysis, coding and indexing procedures, research techniques, statistics, ethics, methods of securing and preserving medical records, and medical record practices and procedures in areas such as radiology, pathology, outpatient department and social service Laboratory practice for proficiency

Organization and Administration—Four semester hours lecture (72 clock hours), 2 semester hours laboratory (72 clock hours)

A study of the organization patterns in hospitals, clinics, and community health agencies, medical staff organization, principles and practices essential to the efficient administration of medical record department, professional relationships, development of standard procedures, functions and techniques of supervision, and human relations Laboratory practice for proficiency

Legal Aspects of Medical Record Science—Two semester hours (36 clock hours)

A study of the principles of law and their applications in the health field, with particular reference to all phases of medical record practice

Problems in Medical Record Administration—Two semester hours (36 clock hours)

Seminar on problems encountered in medical record departments in hospitals, clinics and other essentially medical facilities

Directed Practice Experience—Seven semester hours (504 clock hours)

The supervised learning experience through which the student develops insight understanding and skill in medical record procedures, learns to deal with the problems of medical record personnel, accepts responsibilities and recognizes the need for preserving the confidential nature of medical records, recognizes the contribution of and learns to work with other professional and nonprofessional personnel *Assignments for directed practice experience should be made to departments that conform to the standards set forth in items 11, 12, and 13* The students assignments should be so rotated that experience is gained in all types of medical record procedures previously studied through classroom presentation and initial directed practice One full assignment of approximately 75 to 150 clock hours is strongly recommended

It should be emphasized again that the above curriculum outline does not constitute absolute requirements, but it is intended as a guide for the organization of the education program

It is recognized that the value of semester credits vary from school to school, particularly in regard to laboratory and directed practice work The following scale does not imply that a school must grant the exact number of semester credits stated in these standards so long as the approximate equivalent in clock hours of work is given

1 semester credit—18 lecture hours
1 semester credit—36 laboratory hours
1 semester credit—72 directed practice experience hours
1 quarter credit—12 lecture hours
1 quarter credit—24 laboratory hours
1 quarter credit—48 directed practice experience hours

V Admission to Approved List

20 Application for approval of schools for medical record librarians should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N Dearborn St, Chicago 10, Ill Forms will be supplied for this purpose upon request

21 Approval may be withdrawn whenever in the opinion of the Council a school does not maintain an educational service in accordance with the above standards Whenever an educational program has not been in operation for a period of two consecutive years, approval may also be withdrawn

22 Approved schools should notify the Council on Medical Education and Hospitals whenever personnel or major curriculum changes occur in relation to the administration of the school

VI General Information

23 Inquiries regarding registration of Medical Record Librarians should be addressed to the Executive Director, American Association of Medical Record Librarians, 840 N Lake Shore Dr, Chicago 11, Ill

24 Inquiries regarding careers in the field of medical record science should be addressed to the American Association of Medical Record Librarians, 840 N Lake Shore Dr, Chicago 11, Ill

Medical Record Technicians

Statistical Analysis—Schools for medical record technicians are conducted to train students who, working under the supervision of a qualified medical record librarian or a medical record committee of the hospital, can perform the technical tasks associated with the maintenance and custody of medical records Their relation to the American Association of Medical Record Librarians is described above in the statement from that Association's Committee on Education and Registration

There are 12 approved programs for training medical record technicians These schools reported for 1959 a training capacity for 75 students with an enrollment of 57 students Forty-six students completed training in 1959

Schools seeking approval should apply to the Council on Medical Education and Hospitals of the American Medical Association The required forms will be sent for completion by the Administrator of the proposed program

Inquiries on career opportunities, registration, and accreditation of qualified medical record personnel should be addressed to the American Association of Medical Record Librarians, 840 N Lake Shore Dr, Chicago 11

Essentials for the Training of Medical Record Technicians

Prepared by the Council on Medical Education and Hospitals of the American Medical Association
Revised to December, 1953

Preamble

The Council on Medical Education and Hospitals of the American Medical Association, in cooperation with the American Association of Medical Record Librarians, has established standards for the training of medical record librarians As sufficient personnel is not available in this field additional standards have been prepared for the training of medical record technicians who, working under the supervision of a qualified medical record librarian or a medical record committee, performs the technical tasks associated with the maintenance and custody of medical records The Council establishes standards, inspects and approves training programs, and publishes lists of acceptable courses The American Association of Medical Record Record Librarians is concerned with the promotion of educational activities and registration of qualified record personnel The following standards have been established

I Administration

1 Acceptable courses for the training of medical record technicians may be conducted by general hospitals having adequate teaching material and personnel Hospitals may, if they so desire, establish affiliations with accredited educational institutions

2 Resources for the continued operation of acceptable training programs should be available through regular budgets, gifts, or endowments but may be obtained in part through students' fees Exorbitant fees or commercial advertising are considered unacceptable

3 Training programs conducted primarily for the purpose of substituting students for paid record personnel will not be considered for approval

II Organization

4 Adequate space, light and equipment should be available for the general and educational activities of the hospital departments used in the training of medical record technicians A library containing suitable references, texts, and periodicals should be readily accessible to the students

5 The medical record department should maintain numeric files of all patients' medical records, alphabetically or phonetically filed patients' index, statistical data on births, deaths, and autopsies, and diagnostic, operative, and physicians' indexes A modern system of indexing should be employed with supplemental classifications and files for teaching and demonstration purposes This should include serial and unit number systems, a phonetic file, and disease and operative indexes based on the Standard Nomenclature of Diseases and operations

6 A record of the curriculum, syllabus, teaching plans and a procedure book should be available Transcripts of the students' prerequisite training should be filed in the department To these should be added the details of attendance and grades as well as a list of the experiences obtained by individual students

7 A minimum of two students should be in training However, the maximum number admitted for practical instruction should be determined by the amount of available space, teaching material and properly qualified instructors

III Faculty

8 A competent teaching staff should be assigned to the training program The director shall be (*a*) a qualified medical record librarian, registered or eligible for registration, who has at least one-half the credits necessary for an academic degree from an accredited university or college and five years' experience in charge of a medical record department in an approved hospital, or (*b*) a medical record librarian having equivalent educational qualifications and experience

9 An adequate number of instructors should be available so that students may have immediate guidance and supervision in their assignments

IV Admission Requirements

10 Candidates for admission should be proficient in typing and preferably also in shorthand They should have completed the requirements for high school graduation or should have passed a college

Approved Schools for Medical Record Technicians

Approved by the
Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10

in collaboration with the
Committee on Education and Registration of the
American Association of Medical Record Librarians

Revised to November 8, 1960
Number of Schools, 12

Name and Location of School	Director	Entrance Requirements	Duration of Course Mo	Classes Begin	Student Capacity	Tuition
*Sinai Hospital, Baltimore, Maryland	Evelyn M Carter	High School	9	June	6	$50
*St Joseph Hospital, Lowell, Massachusetts	Sister Marie Roger	High School	9	Sept	6	50
†Mercy Hospital, Port Huron, Michigan	Sister M Pauline Theisen	High School	9	Sept	2	75
St Francis Hospital, Breckenridge Minnesota	Sister Mary Karline	High School	12	Aug	8	100
Charlotte Memorial Hospital Charlotte, North Carolina	Marybeth Hurst	High School	12	Sept	8	100
*Jewish Hospital Cincinnati, Ohio	Carolyn Jo Schwartz	High School	9	Feb	6	150
*Marymount Hospital Garfield Heights, Ohio	Sister Mary Camille	High School	9	June	8	50
*Madison Sanitarium & Hospital Madison, Tennessee	Betty Thorgeson	High School	12	Jan	10	348
Hendrick Memorial Hospital Abilene, Texas	Eloise Odam	High School	9	June	6	100
*St Benedict s Hospital Ogden, Utah	Sister Davidanne	High School	11	Sept	6	100
*Deaconess Hospital Spokane, Washington	Carol F Montgomery	High School	10	Sept	8	200
St Joseph Hospital, Tacoma, Washington	Sister Mary Emmanuel	High School	9	Sept	4	50

* Male as well as female students admitted
† School is on inactive basis

entrance examination for admission to an accedited college or university

11 All applicants should be required to submit a physical health report including record of vaccination All students should be given a medical examination as soon as practicable after admission and this examination should include a chest x-ray

V Curriculum

12 The course of training should include not less than nine months of theoretical instruction and practical hospital experience

13 Theoretical instruction may be presented by informal conferences or formal lectures and should include the following

Subject	*Clock Hours*
Anatomy	40
Medical Terminology Prefixes, suffixes, roots, abbreviations, disease, operative, and drug terms	30
Medical Records Securing, preserving, usage, supervision, indexes, statistics, medicolegal, ethics	65
Total Clock Hours	135

14 Practical training should involve the following activities associated with medical records

1 Orientation	1 week
2 Admitting procedure	
(a) Admitting office Authorization for admission, interview and recording of sociological data, assignment of hospital number, admission forms and patients' register	4 weeks
(b) Medical record department Preparation of index card and chart folder, correlation with previous records, daily census, birth and death certificates	3 weeks
3 Discharge procedures Assembling medical record, checking completeness, daily analysis, referral to record committee, indexing—diagnostic, operative, physicians, patients—monthly and annual reports, filing, release of information to outside agencies	20 weeks
4 Secretarial practice Including relationships to x-ray laboratory, surgical and out-patient departments	4 weeks

VI Clinical Material

15 The training of medical record technicians should be conducted in acceptable general hospitals having a minimum of 4,000 annual admissions These admissions should include an adequate distribution of patients in the various clinical services commonly found in general hospitals

VII Admission to the Approved List

16 Application for approval of a course for medical record technicians should be made to the Council on Medical Education and Hospitals of the American Medical Association, 535 N Dearborn St, Chicago 10 Forms will be supplied for this purpose on request Inquiries on the registration of qualified medical record personnel should be addressed to the American Association of Medical Record Librarians, 840 N Lake Shore Dr, Chicago 11

17 Approval may be withdrawn whenever in the opinion of the Council the course is not maintained in accordance with the above standards When a training program has not been in operation for two consecutive years, approval may also be withdrawn

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION

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THE BEGINNINGS OF MODERN MEDICAL EDUCATION IN THE UNITED STATES AND ENGLAND

A recent review of the history of teaching hospitals in England[1] served as a reminder of the early similarities in the structure of medical education in that country and the United States In both cases, the initial widespread impetus to institutionalize medical education focused largely on the hospital rather than on the university

In England and its American colonies, hospitals were established as institutions primarily concerned with the care of the sick in the latter half of the eighteenth century At that time, medical practitioners throughout the English-speaking world largely acquired their medical knowledge through indentured service as apprentices This system was extended early into the wards of the 'new' hospitals, and improvement resulted from the inevitable exposure of the apprentice to more than one master

Apprenticeships, within and without the hospitals, had the great disadvantage of providing little if any instruction in the fundamental medical sciences Anatomy was the most important of these in that era, to meet this supplementary need, there arose private medical schools operated for the profit of the physician owners and lecturers At best, the combination of apprenticeships and proprietary medical schools provided reasonable but almost totally vocational training, at worst, the training was worth little more than the paper granted as a diploma Such was to be the general framework of medical education in England and its former colonies for more than a century

Throughout this period, there existed in both countries university sponsored educational programs in medicine With only rare and temporary exceptions, the bonds between the medical programs and the parent university were so fragile that medical education did not receive the support of university controlled standards of intellectual honesty and scientific methods The failure of universities in the United States and England during the nineteenth century to rescue medical study from almost exclusive vocational concerns left their medicine almost stagnant when compared to the progress in Germany, where medicine flourished as a university science

It is interesting and pertinent to note that in both countries at approximately the same time conscientious members of the profession made valiant, though not wholly successful, efforts to direct medical education toward higher goals In 1847 the American Medical Association and in 1859 the General Medical Council of the United Kingdom were established, both with a declared purpose of elevating the standards of medical education These two organizations have played significant roles in bringing about the final similarity Medicine and the education on which it rests in these closely related countries has reached a pre-eminent position as it has assumed the academic mantle of a true university discipline

RECRUITMENT FOR MEDICINE

It is never too early to begin the awakening of interest in young people to the exciting career opportunities offered by medicine As a graduate study, medicine can draw only from the pool of youths who have made and implemented the decision to attend college Thus, medicine must share in the obligation to create a desire for college study In turn, this is possible only for those who have undertaken appropriate course work in high school Many factors operate during the childhood years which influence this fundamental decision The physician who attends the youngster or his family can provide a favorable influence through this close relationship in a manner rarely afforded other sciences and professions excepting the ministry

The first substantive career decision is often made during or even before the high-school years The present intense competition for talented youth between industry, sciences, and the professions as well as the need to register early in college (in many instances at the time of admission) for the specific courses required to attain many career goals have conspired to place the high-school years into a position of singular prominence in the career selection process Medicine has been slow in responding to this situation but current activities are encouraging

Through the cooperative efforts of the American Medical Association and the Association of American Medical Colleges, a variety of effective career information materials has been prepared and widely disseminated These materials are available in quantity for broad use Everyone in medicine, in fulfillment of the obligations which accompany the privileges medicine grants, should take advantage of every opportunity to tell medicine's story to young people The career materials are designed to assist in accomplishing this in an effective manner

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[1] Thomson A History and Development of Teaching Hospitals in England *Brit Med J* 2 749 751 (Sept 10) 1960

None of us can afford to presume that the *other fellow* will do our job The truth of the matter is that the *other fellow* will do it but he will be an engineer, physicist, chemist, or any one of a host of *other fellows* who have carefully planned, intensive recruitment programs that daily influence the career decisions of high-school and early college students

MEDICAL-SCHOOL FACILITIES—NEW DIMENSION NEEDED

A year ago, in the Annual Report on Medical Education in the United States and Canada, the need for additional educational facilities to provide adequate numbers of physicians for the nation's growing population was emphasized In discussing the various studies which attempted to define quantitatively the additional number of graduates required, the report stated, "The basic and urgent concern is that all estimates indicate a need for expansion of educational facilities in medicine in a brief period which far exceeds any expansion of such facilities that has occurred in a similar period during modern times "

During the intervening year, little has occurred to alleviate this concern The regents of the University of New Mexico have authorized the establishment of a school of the basic medical sciences Preliminary plans indicate an anticipated enrollment of 50 students per class This represents the only known commitment for the development of a new school, and formal action by the legislature of New Mexico has yet to be taken There has been an increase in the total first-year enrollment, but the increase has been so small that it does not contribute significantly to the solution of the problem

In the Annual Report on Medical Education, published in this issue of THE JOURNAL, p 1423, the Council on Medical Education and Hospitals presents an interesting study of the potential expansion of medical schools If it is assumed that the necessary faculty and facilities can be provided, existing medical schools indicate a potential for the expansion of some 1,700 positions to allow a first-year enrollment of 9,900 students If this were accomplished in gradual fashion by 1969, the present physician-population ratio would likely be maintained through 1971 This prediction is based on Bureau of Census estimates of population growth, a linear projection of 132 physicians per 100,000 population, and an estimate of 750 graduates of foreign *medical schools*, newly licensed in the United States each year

To date, most, if not all, of the considerable attention devoted to the means of securing increased numbers of medical-school graduates has focused promptly on the need for construction of more facilities to expand the production of existing schools and to establish new ones This must be predicated on a widespread willingness to assume without question and without proof that existing facilities for preparing medical students are now subject to maximal use At least superficially there appears to be reason to question the validity of this assumption

The summer-vacation period remains as a tradition from the past in many medical schools This is particularly true during the 2 basic-science years There are basic-science–teaching laboratories which are not transgressed by medical students through *many months of the school year* Yet, it is commonly believed that the basic-science departments offer the first obstacle to increasing enrollments

In the 5-year period ending in 1959, well over $300,000,000 was expended for the construction of medical-school facilities of all types During this time the size of the entering class was increased by 555 For each student added to the first-year class approximately $600,000 was expended for construction It is recognized that this construction represented replacement and renovation of outworn facilities, as well as the construction of new teaching and research laboratories and clinical facilities

It would be an error of grievous proportions to conclude from these tidbits of information that significantly greater numbers of physicians should be produced from present medical-school facilities At best, this would be an assumption at least as weakly based as its opposite However, one conclusion does seem justified and necessary Those concerned with the future of medical education should study carefully and document clearly whether existing educational facilities in medicine are being fully utilized If any potential for greater use is found, its realization must be dependent on a proportionate increase in faculty strength Quality cannot be sacrificed for quantity in medical education If evidence is produced that no additional potential exists, this fact in itself will document the need for the future far more securely than is currently possible

This further *dimension* should be explored not at the expense of but concomitant with present efforts directed toward expansion of medical schools now in being, and the establishment of new schools Medicine and the public interest can only benefit from such a venture

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Wiggins, W S, Shepherd, G R, Hinman J, and Tipner A Medical Education in the United States and Canada *JAMA* 171 1508-1575 (*Nov* 14) 1959

ALLIED MEDICAL SERVICES

In the final report of the Committee to Study the Relationships of Medicine with Allied Health Professions and Services adopted by the House of Delegates in June, 1960, is the statement, "The rapidly changing pattern of medical care resulting from scientific and socioeconomic advances creates constantly expanding demands for a greater diversity of skills and abilities and for concomitant increases in the number of individuals in these specialized fields

The physician has long recognized the significant contribution made by therapists and technicians to the care of his patient It should be equally recognized that such contributions can be no greater than the training and abilities of the therapist or the technician Since the ultimate responsibility of the care of the patient is that of the physician, he has, if for no other reason, a duty to actively support and afford leadership in elevating educational standards and professional competence of the members of the health team The allied professional and technical groups are receptive to such support and cooperative leadership For a number of years there has been successful liaison between medicine and several of the presently established allied medical groups It is reasonable to assume that the rapid advances in scientific knowledge and techniques and the pressure of many social, economic, administrative, and psychological factors upon adequate health services will result in the involvement of many more persons and a greater diversity of groups This increase in the number of persons involved in health care may well overshadow the manifold increase of recent years necessitating more constant re-evaluation and planning in these areas

The medical profession and the related professional and technical groups must formulate jointly ways and means by which sound and progressive plans can be made in the areas of recruitment, education, socioeconomic security, and interrelated professional conduct The physician can be the unifying force' which brings a great diversity of scientific information and service into the proper focus so essential to the care of the health of our people

The Council on Medical Education and Hospitals has provided, for the first time, a comprehensive study of its present role in, and the general nature of, the educational programs of allied medical services It is hoped that physicians and medical personnel in general will familiarize themselves with this study as a basis for actively developing leadership in this vital area If the allied medical services are to grow as integrated participants in health care, they must receive support and encouragement from medicine

MORE TO COME

The preceding editorials on medical education were prepared by staff members of the Council on Medical Education and Hospitals This is a Council of the House of Delegates, staffed by members of the Division of Scientific Activities of the American Medical Association Dr John B Youmans, formerly Dean of the Vanderbilt University School of Medicine, the new Director of this division, reported for duty in Chicago only a few weeks ago Although the editorials and the composition of the education issue were prepared some time before Dr Youmans assumed responsibilities in the division, they have his blessing and concurrence, just as they have the approbation and the nod of assent of the editorial staff of the J A M A

In addition to receiving the editorial opinions from qualified staff members, it seemed appropriate to solicit judgments from persons vitally concerned with medical education whose responsibilities lay outside the domain of the council and outside the profession of medicine Help from three educators was sought Mr Philip Boocock, Headmaster of Nichols School in Buffalo, N Y for more than two decades, has spoken for his preparatory school A high percentage of the graduates of Nichols School continue their education in a liberal arts college or university A limited number follow with a medical education Mr John C Baker is President of Ohio University in Athens A number of the graduates from this university pursue a career in medicine His faculty must provide proper premedical education for those interested And lastly, Mr Deane W Malott of Cornell is the President of a university with a large medical school as one of the several graduate divisions Each educator has displayed a deep interest in medical education, and their judgments are exposed in the following editorials

THE SECONDARY SCHOOL

The call of medicine reaches some youngsters of very tender years Frequently, a boy as young as 12 is already dedicated to medicine, and in his eyes no other calling has quite the same appeal Throughout his secondary school he becomes a highly motivated student, for his goal of medicine lends great determination to his soul He has reached his decision in the romantic period of his life The aura of the hospital after an appendectomy, the kindliness of his doctor, the medical jargon—only half of which he understands—all have enthralled him This lifetime decision seems to come but shortly after he has abandoned his ambition to be a cop on the beat or a fireman This sequence seems to form so frequent a pattern in the development of a young doctor-hopeful" that it could almost be called the standard pattern In this way, the selection of the profession of medicine differs sharply from the selection of every other profession, it has a very personal "come hither" to many boys, and it causes a boy to make a decision of lifetime proportions at a period when no other decisions of his last for more than a month. In fact, it is so enduring that it carries him through the hard-core subjects of his secondary school with a motivation that warms the cockles of a schoolmaster's heart.

But all is not necessarily serene in such cases, for one will find a boy so dedicated but not sufficiently equipped with the mental spare parts to make the finish line. Then it becomes a problem of the most delicate type to unsell our dedicated doctor-to-be, for it is the teacher himself who discerns the limitations first. Should he discourage this budding physician at the very beginning, and thereby bring dreams crashing down around his pupil's head before he is emotionally mature enough to accept his limitations and live with the disappointment? Or should he allow his charge to pursue his program on a limited basis and be ready with a helping hand when the boy begins to stumble as the academic work becomes difficult? The second approach is more tempting, for, as the boy matures, he gains a clearer realization of his limitations. At the same time, his emotional maturity is increasing enough to cope with the disappointment. Of course, it must be admitted that the teacher's first misgivings may not be well founded and that the boy's drive and motivation are strong enough to surmount apparently insurmountable academic hurdles.

What of the secondary school program for our future doctor? Here we turn to medical school requirements, which filter down to the college, which in turn filter down to the secondary school. We in school work have no clear directive from any source, and if we were to ask, we would have as many different items of advice as the number of sources we asked. Of course, there are the basic sciences of chemistry and physics to be thoroughly studied—and probably biology. Some students, however, defer the study of biology until college. Reports from medical schools themselves indicate that mathematics is the area of greatest weakness among their students. This is interesting, for, in conversation with many doctors, one finds that their need of mathematics has not gone beyond intermediate algebra both in their medical studies and in their practice afterward. To the guidance officer in the secondary school falls, therefore, a nice decision to push the student on in mathematics through trigonometry and calculus or allow the student to drop math after three years of study in order to take another course in a broader field.

We in school work recognize strongly that it is our duty to lay a sound foundation in the tool subjects, and we must do so on such a broad basis that the student will not be restricted when later he comes to make a permanent decision as to the exact direction he wants to go. Fundamentally, medical schools seek able, well-trained men, who are articulate and precise in their own language, well-grounded in science and mathematics, and broadly experienced in the humanistic fields. As far as college preparatory schools are concerned, this is precisely their objective in the training of their students.

Although a boy makes the decision to become a doctor, he sometimes changes his mind, with the sophistication and maturity of his growing years. It is not possible to "keep David David" as Headmaster Drury of St. Paul's School has said. To some students, the mercenary rewards of the profession loom larger and larger, and the selection of a field of specialization becomes a crafty balance between the time required to prepare for that specialty and the remuneration derived from its practice. Do medical schools take into account such an attitude when it is present? We can only presume that they do and will continue to do so.

It is good to relate that the group with this attitude happily are in the minority. For the most part, the student studies medicine so that he can help others—this is first. His second reason seems to be his love of science, and his third, although he rarely expresses himself clearly and articulately, is the standing that his profession will give him in the community.

There is little doubt that the long preparation for medicine has had a dampening effect on the youthful enthusiasm of some boys. These schoolboys, however, are still nestlings at heart, and, for them, today is all important and the future is no more than the next vacation away. They pay lip service to the fact that their parents will have to continue their support for four, six, or more years beyond college if they go into medicine, but it isn't a reality to them as yet. They don't understand their father's earning power may diminish in those years and that the extra income devoted to their education would come in so handily in creating security for their parents later on. This is not selfishness, it is just adolescence.

And we are dealing with adolescence. The second decade of life is a period of such spectacular growth physically, emotionally, and mentally that there is little wonder that the changes can be noted from month to month. We school men have a magnificent challenge and the most rewarding opportunity of any calling. If, in our work, we can give the right word at the right time and sow the seed when the soil is fertile, we can make our contribution to humanity through the generation of schoolboys who go through our halls.

PHILIP M. B. BOOCOCK
Headmaster
The Nichols School
Buffalo, N. Y.

THE ROLE OF LIBERAL ARTS IN PREPARATION FOR MEDICINE

All too little attention is paid to the importance of liberal arts in preparing students for the medical profession. Few of the students with whom I have talked about being medical doctors ever ask what they should study as students in other fields of learning do—they seem to know the answer—German, a smattering of Latin, mathematics, and science. And they frequently comment, "These courses will help me get into medical school'!

Unfortunately this ready, almost naive, answer is all too often an indication of lack of knowledge rather than wisdom. It overlooks the complicated world today in which medical doctors serve and the beings who inhabit it.

The significance of this question, what should prospective doctors study in college, is all too often recognized only by those doctors who have lived long enough and hard enough to realize the characteristics of our world and what they mean in the way of responsibilities to medical men and women.

In fact, liberal arts colleges have much more to offer professionally than the average medical student realizes and, if the students do not study liberal arts subjects in college, they never may have the chance to secure this basic broadening education.

Our world might fairly be described as unnatural during the last half century because of the rapidity of physical and social change which has no end in sight. There has been slow evolutionary growth and less chance to adjust to these gigantic changes than in previous centuries. Although the changes surrounding man on the outside are great, man himself has changed little on the inside.

Human beings under these unnatural conditions are, therefore, torn between erratic personal emotionalism caused by the loss of customary historical values and inept standardization daily forced on us by television, radio, and other mass media, and still further confounded by a loss of religious and ethical principles and the need for them as our concept of the universe and the forces behind it expands. These conflicting forces tend to lead us to grave superficiality at a time when accurate knowledge and even extreme specialization are essential.

One intelligent and comprehensive answer to the question of what students who hope to be medical doctors should study is simply, "Liberal Arts," with heavy emphasis on 'Liberal.' It refers to those studies which actually liberate and enlighten the mind and soul of the prospective doctor from petty objectives and narrow vision so that he can gain early in his career, before specialization becomes necessary, those great qualities of spirit and intellect which will help him in serving the "whole man."

Doctors need a knowledge of philosophy, ethics, and religion to stabilize them and help others in an unstable world, a knowledge of history to look into the future clearly and courageously, close acquaintance with literature to understand the dreams, the ideals, the traditions of man, a competency in writing and languages in order to communicate with others, an understanding of government and politics to appreciate the revolutionary trends of our era, broad understanding of science to be a truly professional man, above all, to be at home in the world of books—a perpetual source of freedom, inspiration, and light, and, finally, an appreciation of those deep and complicated forces which build integrity in men.

It is the role of the liberal arts college to expose all those who will listen to these great forces, but especially to prepare medical men and women for dedicated professional service.

John C. Baker
President
Ohio University
Athens, Ohio

A UNIVERSITY PRESIDENT LOOKS AT MEDICAL EDUCATION

An uneasy and highly sensitive equilibrium is perhaps the most a university president can hope to attain in his relationships to his faculty. Charged with full responsibility for the entire operation by his Board of Trustees, in many areas of these responsibilities he is merely symbolic of central authority. Meanwhile, the mantle of academic freedom is thrown more widely around faculty members as an insulative device, to protect them from administrative jurisdiction.

In medical faculties, however, a whole congeries of additional influences arise to affect these administration-faculty relations. There are centrifugal thrusts away from university-oriented procedures and policies, which add to the concern of the university president and his trustees.

There is the growth of the great medical center—a complex of hospitals, research institutes, and training programs of various sorts—with an interrelated administrative hierarchy often so complicated that central authority is impossible to identify. At any rate, the poor student seems to be swallowed into this macrocosm almost to the point of losing his identity, he may even find his studies interrupted by pressures to do all kinds of work and perform all sorts of services, not directly allied to his curricular responsibilities and desires. The teacher in these centers almost inevitably becomes more and more enmeshed in research, unless he is one of these rare and dedicated souls who so likes to teach that he resists the entanglements except as they serve to stimulate his abilities as a teacher. With the growth of these centers, too, comes more and more concern with more and more complicated techniques of patient care and service and greater involvement in all the complex interrelationships and in the frustrating attempts to reconcile the many divergencies in policies. Committees proliferate, while paper work becomes appalling in the ineffective and hopeless task of keeping everyone posted. And the startling fact emerges that, with all of this administrative and organizational complexity, no more medical students are being educated than in the simpler structure under which medical schools were organized before the day of the center concept.

Another problem is one of teacher identity. In too many institutions, the chief members of the teaching staff are on neither a geographic nor an economic full-time basis. Hence, the individual teacher's commitment to the university is not uppermost in his way of life. His devotion to medical education is ancillary to medical practice, and his interest in students may therefore be more casual.

This latter influence may also contribute to a certain intellectual isolation on the part of medical faculties, which seems to bear no relation to physical nearness of the school to other divisions of the university. This isolation, in turn, tends to minimize the social consciousness of medical faculties and medical students. The medical graduate, therefore, emerges as perhaps the most highly skilled and trained of all professional persons, but often the least aware of his obligations as a citizen for helping to carry on the philanthropic, cultural, and political life of his community. This isolation further results from the fact that the dean of the medical school often tends to seek leadership from the strong and able Association of American Medical Colleges, rather than from his own university president and Board of Trustees. Thus, he is often led to embark upon professional programs and policies embarrassing at times to the university administration, who are uninformed of what the highly organized medical deans are doing until too late to present a caveat.

The difficulty of gaining entrance into a medical school has caused some overemphasis upon the biological and physical sciences in premedical education, an emphasis further heightened by the difficulty of fitting the expanding medical curricula into the allotted medical school years. All of this tends to put undergraduate colleges under pressure to serve the professional interests of medicine. In addition, the premedical student does not receive the same opportunity for a broad liberal education as is available to undergraduates preparing for other types of professional training at the graduate level.

The university president, furthermore, is concerned by the ever-lengthening time-span of medical education, and is puzzled that there are not somewhere some efficiencies that might be injected into the educational program, some curricular surgery that might reduce the length of training and stem the tendency to add to the formal education and to the years of apprenticeship. Someday there must be a readjustment, as it becomes increasingly difficult for the medical practitioner to attain financial competency during the brief years available for active practice. Already there are signs that prospective students are turning away from the rigors of medical education into the equally dramatic and challenging areas of the physical sciences and their applications.

These are some of the problems of medical education as viewed by one university president. In outlining them, I am well aware that I am writing this at the request of the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. This editorial is for a professional reader constituency, and I am probably safe to assume that I have raised the hackles of a considerable proportion of the readers.

At any rate, I know that I have not covered at all the many and varied satisfactions almost inherent in the relationship between a university president and his medical faculty—of the warm friendships, of mutual admiration, of the loyalty, and devotion and cooperation, by which a whole institution moves forward, with everyone giving a thrust to the operation.

And if your wandering thoughts lead you to wonder how my own Cornell medical faculty get on with such a querulous administrator, may I reassure you. They have heard it all before—these questions and doubts—and they have heard it from me!

DEANE W. MALOTT
President
Cornell University
Ithaca, N. Y.

THE IMMORTALITY OF WORDS

Of all man's creations words have the greatest capacity for immortality. They persist throughout the centuries, long after the ideas which they originally connoted became obsolete, and many of them are survivals from entirely different modes of thinking. This capacity for immortality is accompanied by a remarkable capacity for adaptability. On the one hand, words may be transferred to new meanings. *Pneuma*, for example, which now has an extensive application in medicine and mechanics, to the Greeks had a variable meaning connected with their concepts of the soul and spirit. On the other hand, the original meaning may be retained although the underlying reason has been abandoned. One example is *melancholia*, a condition which was originally attributed, as its name implies, to preponderance of black bile. In the retention of such a word there is no harm, the meaning is clear although we no longer believe in the existence of black bile. To abandon such words, even were this possible, would be to deprive our language of much that is expressive and picturesque.—*Roberts, F.*, Medical Terms: Their Origin and Construction, Springfield, Ill., Charles C Thomas, Publisher, 1959, pp. 1-2.

CLINICAL NOTE

Pheochromocytoma

Gordon H Hardie M.D and Ralph L Suechting, M D., Neenah Wis

Pheochromocytoma is still considered a rare disease A review article by Watkins[1] reported slightly over 300 cases reported in the literature until 1957 It has been estimated, however, by Graham[2] that about 800 people die annually in the United States either with or of this disease To reemphasize the symptomatic, diagnostic, and therapeutic features of pheochromocytoma, we are reporting a typical case observed recently

Report of a Case

A 46-year-old married man noted the onset of his illness on Oct 2, 1957 While duck hunting he vigorously exerted himself collecting game in a thick marsh He developed severe pounding headache, generalized weakness, diaphoresis, tremulousness, nausea, and severe prostration These typical symptoms were associated with the less typical symptom of increased auditory sensitivity This acute attack lasted about 15 minutes, although the headache persisted for several hours A few additional, but less severe, attacks occurred during the ensuing days, and the patient was admitted to a hospital elsewhere His physician made a lumbar puncture and found the cerebrospinal fluid clear and colorless The initial pressure [illegible] mm H_2O The protein level was 27

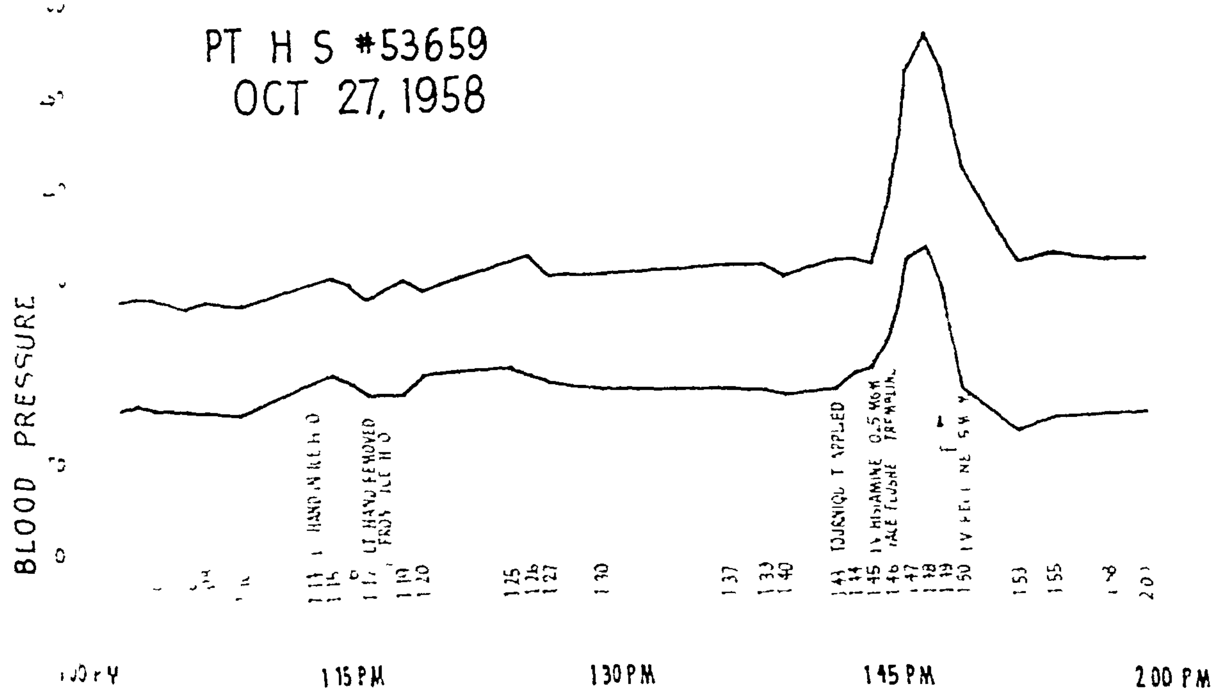


Fig 1 —Blood pressures recorded while patient was undergoing test for pheochromocytoma (Oct 27, 1958)

From the Theda Clark Memorial Hospital

contained two lymphocytes Symptoms continued and the patient was referred and admitted to the neurosurgical service of the Theda Clark Memorial Hospital by one of us (R L S)

At that time results of routine laboratory studies were within normal limits Results of an electroencephalogram obtained on Oct 18, 1957, were reported as mildly slow for his age in drowsiness and light sleep and showed a slow wave focus in the bifrontal areas General physical examination and neurological examination at this time showed results within normal limits The blood pressure was 130/75 mm Hg The patient was discharged without a definite diagnosis, but he was thought possibly to have a seizure associated with the temporal lobe or diencephalic seizures and was, therefore, given diphenylhydantoin (Dilantin) sodium

During the ensuing months the attacks gradually became less severe and less frequent and in the spring of 1958 almost completely disappeared except for some persistent attacks of diaphoresis and trembling In the fall of 1958 the symptoms returned in a typical pattern and with marked severity The patient again complained of episodes of severe headaches, nervousness, perspiration, nausea, and occasional vomiting He usually had

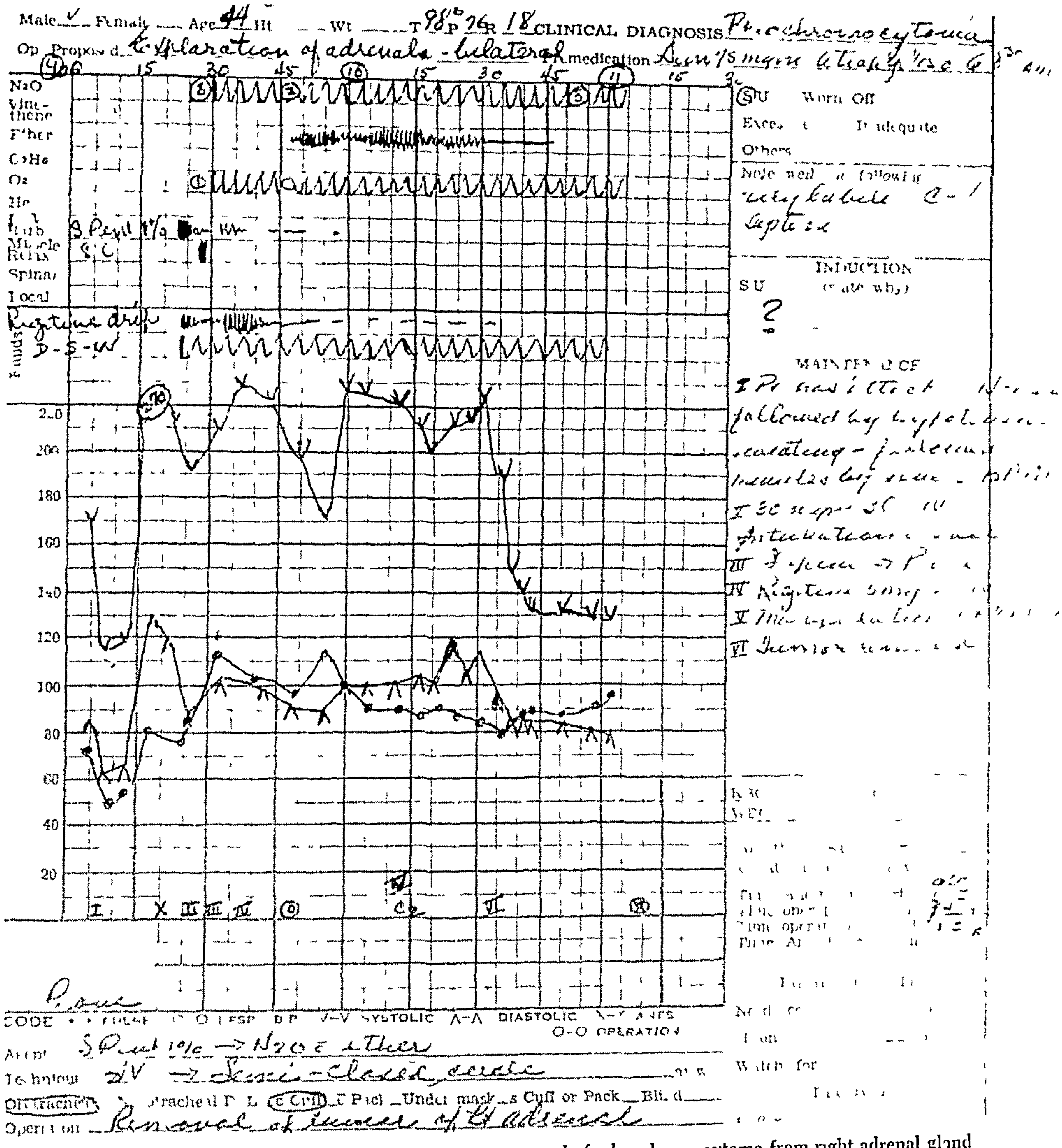

Male ✓ Female Age 44 Ht Wt T 98.6 P 76 R 18
CLINICAL DIAGNOSIS Pheochromocytoma
Op Proposed Exploration of adrenals - bilateral
medication
N2O
Vinethene
Ether
C3H6
O2
He
Pent 1%
Muscle Relax
Spinal
Local
200
180
160
140
120
100
80
60
40
20
Worn Off
Excess
Inadequate
Others
INDUCTION
MAINTENANCE
CODE SYSTOLIC DIASTOLIC
O-O OPERATION
Agent Pent 1% → N2O c ether
Technique IV → Semi-closed circle
Orotracheal Endotracheal Cuff or Pack
Operation Removal of tumor of R adrenal

Fig 2 —Record of patient's anesthesia during removal of pheochromocytoma from right adrenal gland

attacks in the morning on arising and in the evening after bending over to lift up some wood for his fireplace On many occasions the patient had prodromata of prickling sensation in his hands and arms The attacks frequently were so severe that he was forced to assume a recumbent position, the only way in which he could get relief He was readmitted to the neurosurgical service at Theda Clark Memorial Hospital on Oct 24, 1958, for further study

During the year between his two admissions a repeat EEG showed normal results On this last admission he had another EEG, which was interpreted as showing a slow wave focus bifrontally and appeared to be the same as the first The general physical examination showed findings entirely within normal limits His height was 5 ft 11 in (180 cm) His weight was 167 lb (76 kg) The blood pressure was 138/88 mm Hg when he was in the reclining position The basal metabolic rate, which is frequently increased in patients with pheochromocytoma, was +9%, and fasting blood sugar level, which is also often increased, was 123 mg % On this admission the working diagnosis was again a possible temporal lobe tumor, a secondary diagnosis of pheochromocytoma was to be ruled out Since essentially normal blood pressure had always been reported, the central nervous system was first investigated, and on Oct 25, 1958, a percutaneous carotid arteriogram was made with the patient under thiopental (Pentothal) anesthesia This study showed negative results, but during the procedure there was a marked burst of hypertension, which was the first recorded evidence of paroxysmal hypertension in this patient At this time the blood pressure increased to 290/150 mm Hg

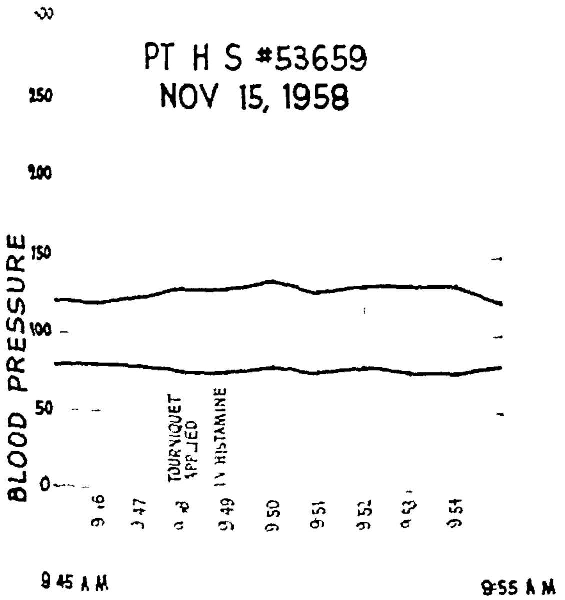
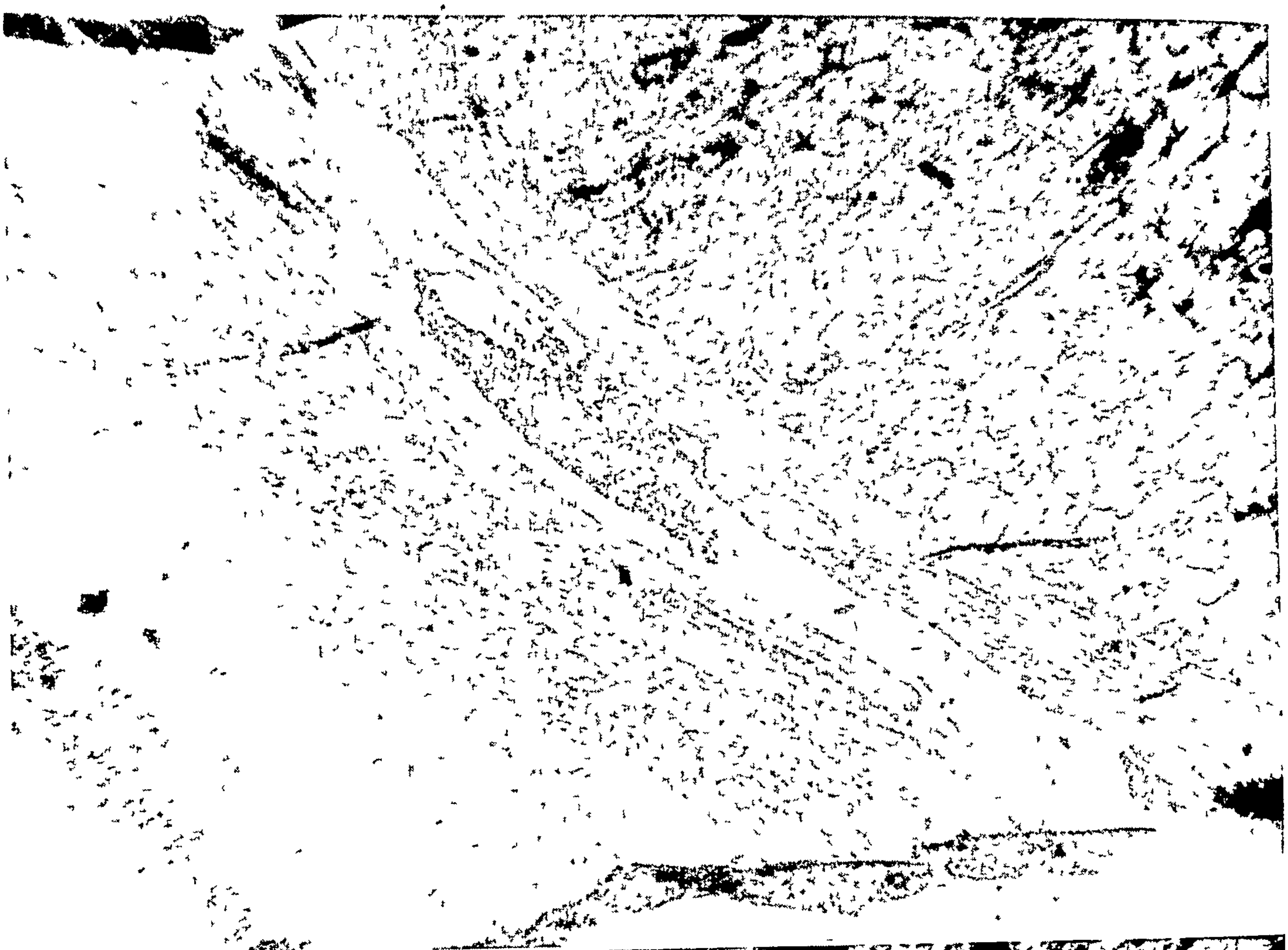


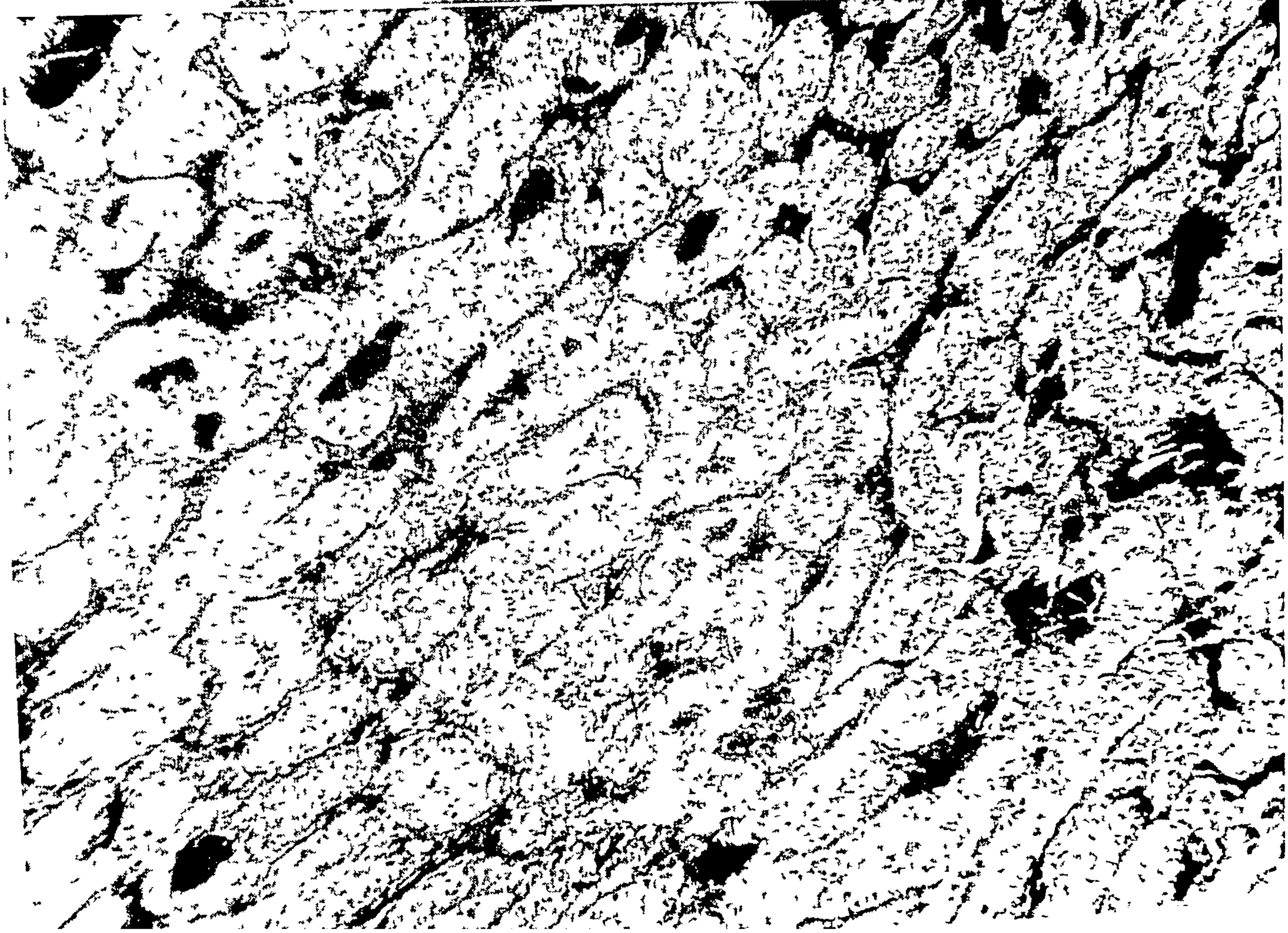
Fig 3—Recordings of postoperative blood pressures, demonstrating clinical absence of any more abnormal chromaffin tissue (Nov 15, 1958)

The patient was then seen in consultation by a member of our medical service and the diagnosis of pheochromocytoma was established (fig 1) In this figure it will be noticed that the patient first had his hand immersed in ice water to determine the general lability of his vascular system A tourniquet was then applied, and 0 025 mg of histamine base was injected intravenously This provocative test was selected because the patient's blood pressure was normal when he was resting Had he had persistent hypertension it would not have been made Instead, an attempt would have been made simply to lyse the blood pressure with phentolamine (Regitine) hydrochloride or some similar agent After the attack of hypertension, which was brought about by the administration of histamine, the process was promptly reversed with the injection of 5 cc of phentolamine hydrochloride Roentgenographic studies, including chest films, routine skull roentgenograms, and an intravenous pyelogram, all showed normal findings A presacral air insufflation was not felt to be indicated because of its attendant dangers and frequently misleading results

The patient was then seen by a member of the surgical service (G H H) On this occasion the patient first complained of vague discomfort in the right flank from time to time which, however, he did not associate with any of his attacks Deep palpation at this time in the right flank area caused a typical attack, which was promptly reversed with use of additional phentolamine Because the patient was well built physically and had a deep chest, we felt that the usually recommended transverse abdominal approach might be unnecessarily difficult It is well known (Stainback[3] and Kvale[4]) that these tumors can arise from the chromaffin tissue anywhere within the abdomen and even in the chest, but most of them are located in the adrenal glands and most commonly on the right We elected to explore the adrenal area via the more accessible route, through the bed of the 12th rib posteriorly (and bilaterally if necessary) with the patient prone As he had complained of some mild flank discomfort on the right and in view of the predilection of these lesions toward this direction, the right side was first exposed We found a firm, round tumor, 4 by 3 by 2 cm, located within the substance of the right adrenal gland

The patient's anesthetic record can be seen in fig 2 Throughout the procedure the anesthesiologist maintained an intravenous drip of phentolamine hydrochloride which made possible the maintenance of the patient's blood pressure at considerably lower levels than those he experienced during arteriography a few days previously After removal of the tumor the blood pressure decreased promptly to normal levels This decrease usually follows the removal of tumors which have been causing





paroxysmal attacks of hypertension One must be prepared for a profound decrease of blood pressure even in patients with such tumors and particularly in patients in whom the hypertension has been sustained To combat this eventuality a solution of levarterenol should be in readiness

The patient made an uneventful recovery and was again seen by our medical consultant, who made a repeat histamine test In fig 3 can be seen the normal response to intravenously administered histamine confirming our clinical impression that no further abnormal chromaffin tissue remained Pathological report revealed a typical picture of pheochromocytoma without mitotic figures (fig 4) The patient had remained completely well at the time of this writing and had had no further attacks or symptoms to suggest any recurrence of his disease

Comment and Summary

A man had a typical case of the paroxysmal type of pheochromocytoma The tumor was on the right adrenal gland, as is most frequently the case, and was removed successfully We used the operative expedient of a posterior and bilateral adrenal exposure, which can be used when the usually recommended transabdominal approach is felt to be too difficult or unusable

There are many conditions which resemble a pheochromocytoma, the most common being a state of anxiety or hysteria, often occurring with hyperventilation Other diagnoses that have confused the evaluation in a group of patients with pheochromocytoma include vascular headaches, cerebral vascular accidents, chronic nervous fatigue, menopausal tension, angioneurotic edema and epilepsy[5] That cases of pheochromocytoma may resemble intracerebral disease or space-occupying lesions is well known Bruce[6] noted that the ophthalmological findings cannot be distinguished in a case of pheochromocytoma from those encountered in essential hypertension Papilledema with or without hemorrhage may be encountered and can be extremely suggestive of a brain tumor

Often the initial attacks are first thought of as various types of seizures Since Penfield[7] described diencephalic autonomic epilepsy in a patient with a tumor of the third ventricle, other reports of diencephalic seizures have appeared There are cases which have predominantly sympathetic manifestations, and the prodromata may consist of restlessness, increasing blood pressure, and basal dilatation of the skin, usually followed by a series of vegetative symptoms of lacrimation, diaphoresis, salivation, dilatation of the pupils, increased heart rate, and slow respirations, together with dizziness and headache[8] The case presented had many of these findings, which made us think first of cerebral difficulties rather than paroxysmal symptoms referable to a pheochromocytoma

116 S Commercial St (Dr Suechting)

References

1 Watkins, D B Pheochromocytoma Review of Literature *J Chron Dis* 6 *510-527 (Nov) 1957*

2 Graham J B Pheochromocytoma and Hypertension Analysis of 207 Cases, Internat Abstr Surg **92:**105-121 1951

3 Stainback, W C and Robbins, F R. Pheochromocytoma, Am J Surg **94:**955 958 (Dec) 1957

4 Kvale, W S Clinical Aspects of Pheochromocytoma, Minnesota Med **14:**291-295 (May) 1958

5 Hutchison, G B , Evans, J A and Davidson D C Pitfalls in Diagnosis of Pheochromocytoma, Ann Int Med **48.**300-309 (Feb) 1958

6 Bruce, G M Changes in Ocular Fundus Associated with Pheochromocytoma of Adrenal Gland Report of Three Cases, Arch Ophth **39.**707-730 (June) 1948

7 Penfield, W Diencephalic Autonomic Epilepsy, Arch Neurol & Psychiat **22:**358-374 (Aug) 1929

8 Geoghagen, T and Mueller E J Diencephalic Autonomic Attacks Report of Case with Predominantly Sympathetic Manifestations, New England J Med **247:**841-842 (Nov 27) 1952

HIPPOCRATIC OATH —The Oath is one of the sixty books composing the Hippocratic Collection, or Corpus Hippocraticum, which was brought together and edited, at the commencement of the third century B C , by a group of Alexandrian scholars at the request of Ptolemy At the time when the collection was edited doubt existed as to which books were written by Hippocrates the Great himself, to-day it is generally accepted that he was the author of very few of them Thus, of the sixty books, Gruner attributes ten, von Haller eleven, Littre twelve, and Daremberg two only, to the Father of Medicine Be this as it may, whoever composed the Oath, it remains an historic document of the highest importance because it gives us all the data relating to the constitution and teaching of the mystery of the old Greek physicians the Companions of Aesculapius It likewise teaches us the moral obligations which the members of the medical body took upon themselves in their relationship with their patients, and among themselves, as well as with the community at large As such it is a treatise on deontology of very great moral value, which has been the guide of the medical profession from the time of Hippocrates —C G Cumston Introduction to History of Medicine From Time of Pharaohs to End of Eighteenth Century New York Alfred A Knopf, 1926

DEATHS

Anderson, Alexander Gordon, Eudora, Ark., Kentucky School of Medicine, Louisville, 1890, died June 15, aged 90, of cerebrovascular disease

Angelicola, Fannie Updyke Ⓜ Elmira Heights, N. Y., Woman's Medical College of Pennsylvania, Philadelphia, 1910, died in the Arnot-Ogden Hospital in Elmira Aug. 22, aged 87, of carcinoma of the stomach

Applegate, Edward Taylor Riggs, Pennington, N. J., Columbia University College of Physicians and Surgeons, New York City, 1906, for 12 years member of the board of education, served on the staff of St. Francis Hospital in Trenton, died in the Mercer Hospital, Trenton, Aug. 23, aged 81, of prostatic carcinoma

Aronoff, Arthur Edward, Ann Arbor, Mich., Columbia University College of Physicians and Surgeons, New York City, 1953, certified by the National Board of Medical Examiners, member of the American Psychiatric Association, interned at the University Hospital, where he served a residency, served in the Naval Reserve from July, 1956, to June, 1958, died June 12, aged 32

Avery, Wyatt Henderson, Shelbyville, Tenn., Memphis (Tenn.) Hospital Medical College, 1912, past-president of the Bedford County Medical Society, a director of the First National Bank, past-president of the Middle Tennessee Medical Association, on the staff of the Bedford County Hospital, died Sept. 1, aged 80, of cancer of the stomach

Axline, Clark Gibson, Lancaster, Ohio, Starling-Ohio Medical College, Columbus, 1908, veteran of Spanish-American War and World War I, during World War II medical examiner for the Selective Service Board, associated with the Lancaster-Fairfield Hospital, where he died Sept. 1, aged 82, of cerebral vascular accident

Barron, William Rowan, Columbia, S. C., Medical College of South Carolina, Charleston, 1908, past-president of the Columbia Medical Society, member of the American Urological Association, one of the founders and charter member of the Southeastern Urologic Association, specialist certified by the American Board of Urology, served on the staff of the South Carolina Baptist Hospital, where in 1948 his portrait was presented as a gift by his many friends among the medical and nursing professions and the laity, served as a member of the state board of health and state water pollution board, formerly a trustee of Presbyterian College, Clinton, died Aug. 12, aged 76, of multiple diverticuli of the jejunum with massive hemorrhage

Barto, Robert Edwin Ⓜ Elizabethville, Pa., Jefferson Medical College of Philadelphia, 1915, president of the First National Bank of Elizabethville, a veteran of World War I, died in Harrisburg Aug. 20, aged 69, of bronchogenic carcinoma

Battaglia, Dominic Ⓜ Johnstown, N. Y., Albany (N. Y.) Medical College, 1933, fellow of the American Society of Anesthesiologists, associated with Johnstown Hospital and St. Mary's Hospital, Amsterdam, where he died Aug. 22, aged 52, of coronary occlusion

Bender, Jesse Lincoln, Greenland, Mich., Milwaukee Medical College, 1907, died in the Ontonagon (Mich.) Memorial Hospital Aug. 31, aged 83, of cerebral hemorrhage

Bernhardt, Edmound Lloyd, Milwaukee, Rush Medical College, Chicago, 1924, served as health officer of West Bend, died Aug. 11, aged 63, of generalized arteriosclerosis

Bernstein, Edmund, New York City, Medizinische Fakultat der Universitat, Vienna, Austria, 1937, died Aug. 5, aged 54, of coronary occlusion

Bogan, Joseph Borrows Ⓜ Washington, D. C., born in 1878, George Washington University School of Medicine, Washington, D. C., 1907, specialist certified by the American Board of Anesthesiology, member of the American Society Anesthesiologists, past-president of the Southern Association of Anesthesiologists, veteran of World War I, formerly on the faculty of his alma mater, consultant in anesthesia to Children's, Episcopal Eye, Ear and Throat, District of Columbia General, and Garfield Memorial hospitals, died in El Reno, Okla., Aug. 28, aged 82, of arrhythmia and arteriosclerotic heart disease

Booth, Frederick Kern, Tarentum, Pa., Western Pennsylvania Medical College, Pittsburgh, 1905, past-president of the board of health of Tarentum, on the staff of the Allegheny Valley Hospital, died Aug. 20, aged 80, of congestive heart failure

Brown, Alfred Jerome Ⓜ Council Bluffs, Iowa, born in New York City Aug. 27, 1878, Columbia University College of Physicians and Surgeons, New York City, 1903, formerly instructor in anatomy at his alma mater, in 1919 he moved to Omaha, where he resumed his teaching career at the University of Nebraska College of Medicine, serving as associate professor, then professor of surgery, becoming professor of surgery emeritus in 1943, past-president of the Western Surgical Association, the Omaha Douglas County Medical Society, and the Omaha Mid-West Clinical Society, member of the Ameri can Surgical Association, American Association for the Surgery of Trauma, International Society of Surgery, Central Surgical Association, American Association of Railway Surgeons, American Association of Anatomists, Sigma Xi, and the Alpha Omega Alpha, fellow of the American College of Surgeons, the designated physician of United States Employees Commission, now the Federal Security Board, and the designated physician of the United States Civil Service Commission, veteran of World War I, at one time associated with the Presbyterian Hospital, Vanderbilt Clinic Dispensary, and surgical director of the first surgical division, Bellevue Hospital-Columbia University division, in New York City, active in the University Hospital, Bishop Clarkson Memorial Hospital, and later active as a consultant to the Veterans Administration Hospital in Omaha, local, district, or consulting surgeon to four railroads, author of numerous articles on general surgery, including "Old Masterpieces in Surgery," a series of articles published each month in *Surgery, Gynecology & Obstetrics* for many years, died in the Edmundson Memorial Hospital Aug. 21, aged 81, of recurrent massive hemorrhage from the gastrointestinal tract due to carcinoma of the ascending colon.

Bruce, George Draper, Baytown, Texas; University of Texas School of Medicine, Galveston, 1933; associated with the San Jacinto Memorial Hospital, where he died Aug. 25, aged 52, of cirrhosis of the liver.

Buell, Arthur Whitton, Long Beach, Calif.; New York Homeopathic Medical College and Flower Hospital, New York City, 1908; associated with the Seaside Memorial, St. Mary's Long Beach, and Long Beach Community hospitals; trustee emeritus of the Occidental College, Los Angeles, where he served for many years on the board of trustees; died in the Memorial Hospital of Long Beach Sept. 4, aged 80, of hemorrhage from gastric ulcer.

Burkett, Norman Andrew Ⓜ Council Grove, Kan.; University of Kansas School of Medicine, Kansas City, 1940; interned at the Kansas City General Hospital in Kansas City, Mo.; veteran of World War II; secretary of the Morris County Medical Society; formerly practiced in Junction City, where he was health officer of Geary County; chief of staff and past-president, Morris County Hospital; died in St. Joseph Hospital, Kansas City, Mo., Sept. 8, aged 44, of gastrointestinal hemorrhage.

Burns, Stanley Sherman, St. Louis; Washington University School of Medicine, St. Louis, 1910; member of the American Academy of Ophthalmology and Otolaryngology; for many years on the staff of the Lutheran Hospital, St. Luke's Hospital, Jewish Hospital, and the Deaconess Hospital, where he died Aug. 22, aged 71, of generalized arteriosclerosis.

Burt, Judson Murl Ⓜ Caledonia, N. Y.; University of Buffalo School of Medicine, 1902; member of the American Academy of General Practice; health officer in the town and village of Caledonia; director of the Caledonia First National Bank; served on the school board; associated with the Genesee Memorial Hospital, Batavia; died Sept. 2, aged 85, of carcinoma of the liver with metastases to the colon.

Byrom, Emmett Travis Ⓜ Dallas, Texas; Baylor University College of Medicine, Dallas, 1924; died in Grand Prairie Sept. 6, aged 69, of a heart attack.

Clark, William Albert Jr., New Wilmington, Pa.; Rush Medical College, Chicago, 1903; died Aug. 23, aged 81, of coronary disease.

Copeland, Silas Morgan Ⓜ Jacksonville, Fla.; Emory University School of Medicine, Atlanta, 1915; veteran of World War I; died in St. Vincent's Hospital Aug. 20, aged 73, of coronary thrombosis.

Ekings, Frank Parker, Altadena, Calif.; New York Homeopathic Medical College and Hospital, New York City, 1903; formerly practiced in Paterson, N. J., where he was on the staffs of the Paterson General, Barnert Memorial, and St. Joseph's hospitals; died Aug. 20, aged 82, of chronic pyelonephritis.

Ewan, Robert Thornton, Lewistown, Ill.; College of Physicians and Surgeons, School of Medicine of the University of Illinois, Chicago, 1904; on the staff of the Graham Hospital in Canton; died in the St. Martha's Nursing Home in Knoxville Aug. 18, aged 83, of uremia.

Finegan, Rexford William, New York City; Creighton University School of Medicine, Omaha, 1935; member of the Association of Life Insurance Medical Directors of America; medical director of underwriting of the Metropolitan Life Insurance Company; veteran of World War II; died Aug. 21, aged 49, of a heart attack.

Fraser, David Earl, Lyndonville, N. Y.; University of Buffalo School of Medicine, 1903; served as physician for the Lyndonville schools, village health officer, and county coroner; veteran of World War I; died Aug. 21, aged 80, of coronary thrombosis.

Gary, William Henry Harrison, Thomaston, Maine; Boston University School of Medicine, 1904; died in Camden Aug. 21, aged 85, of cerebral hemorrhage.

Granzig, William Franz, Des Plaines, Ill.; Chicago Medical School, 1939; member of the staff of Northwest Community Hospital in Arlington Heights; died Aug. 31, aged 47, of a heart attack.

Haley, Francis John, Buffalo; University of Buffalo School of Medicine, 1916; veteran of World War I, for many years an examining physician for the Workmen's Compensation Board, died in the Buffalo General Hospital Aug. 3, aged 68, of coronary thrombosis.

Hamburger, Louis Philip, Baltimore; born in Baltimore Sept. 18, 1873; Johns Hopkins University School of Medicine, Baltimore, 1897; fellow of the American College of Physicians; since 1948 assistant professor of medicine emeritus at his alma mater; member of the American Association of University Professors, American Association for Advancement of Science, Medical Library Association, Southern Medical Association, Association for Prevention of Tuberculosis, and Phi Beta Kappa; past-president of the Baltimore City Medical Society and the Johns Hopkins Medical Society; since 1937 consultant to the Baltimore City Health Department; served as a member of the committee of revision of the United States Pharmacopoeia; on the staffs of the Johns Hopkins Hospital, Union Memorial Hospital, Hospital for the Women of Maryland, and Church Home and Infirmary; consultant to Sinai Hospital and South Baltimore General hospitals; died Aug. 26, aged 86, of arteriosclerotic heart disease.

Henderson, Will Irvine Ⓜ New York City; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1917; veteran World War I; director of the Wickersham Hospital; died Aug. 28, aged 70, of diabetic gangrene.

Kavan, Wenceslaus John Ⓜ Clarkson, Neb.; Creighton University School of Medicine, Omaha, 1912; secretary treasurer of the Colfax County Medical Society; died in the Schuyler Memorial Hospital Aug. 20, aged 75, of myocardial infarction.

Kibbie, Kent Valorous Ⓜ Fort Worth, Texas; Fort Worth School of Medicine, Medical Department of Texas Christian University, 1898; past-president of the Tarrant County Medical Society; formerly on the faculty of Baylor University College of Medicine in Dallas; veteran of World War I; on the staffs of the St. Joseph's and Harris hospitals; died Aug. 21, aged 86, of cerebral vascular accident.

Kirton, Job Richard William, Calumet, Mich.; Michigan College of Medicine and Surgery, Detroit, 1898; past-president of the Houghton County Medical Society; served on the staff of the Calumet and Hecla Hospital; died Aug. 24, aged 83, of coronary thrombosis.

Klein, Harold Henry Ⓜ Scranton, Pa.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1935; veteran of World War II; on the staffs of the Mercy, Hahnemann, and Scranton State hospitals; died Aug. 20, aged 47, of myocardial infarction.

Kramer, Allen Clarence, Tulsa, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1925; veteran of World War I; formerly county superintendent of public health; at one time director of the Farmers and Merchants State Bank; associated with the Hillcrest Hospital, where he died Aug. 19, aged 60, of coronary thrombosis.

Kreis, George Joseph Jr., Elkton, Md.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1944; member of the American Academy of General Practice; an officer in the medical corps of the U. S. Naval Reserve from September, 1944, to July, 1946; on the staff of the Union Hospital; died in the Chester County Hospital, Westchester, Pa., Aug. 29, aged 41, of injuries received in an automobile accident.

Kudlich, Manfred Heinrich Ⓜ Hazleton, Pa.; Jefferson Medical College of Philadelphia, 1909; veteran of World War I; associated with the Hazleton State Hospital; died Aug. 27, aged 74, of cancer of the lungs.

Loos, H. Clifford Ⓜ Santa Monica, Calif.; Cooper Medical College, San Francisco, 1905; veteran of World War I; past-president of the San Diego County Medical Society and the San Diego Board of Health; co-founder of the Ross-Loos Medical Group; served as a member of the state board of medical examiners; on the staff of the Queen of Angels Hospital in Los Angeles, where he died Aug. 30, aged 78, of cerebrovascular thrombosis due to arteriosclerotic cardiovascular disease due to arterial hypertension.

Newman, Wilfred Ewart Ⓜ Spokane, Wash.; Rush Medical College, Chicago, 1928; member of the American Academy of General Practice; a member of the eastern Washington appeal board of the state selective service system for many years; associated with the Deaconess Hospital, where he was past-president of the staff, and where he died Aug. 4, aged 62, of pulmonary embolus.

Peete, Edwin Morris, Memphis, Tenn.; Memphis Hospital Medical College, 1901; died in the Baptist Hospital Aug. 5, aged 82, of cerebral vascular accident.

Pelletier, Emery Ⓜ Providence, R. I.; University of Montreal Faculty of Medicine, Montreal, Que., Canada, 1927; on the staff of St. Joseph's Hospital, where he died Aug. 8, aged 68, of pneumonia.

Plukas, Joseph Martin Sr., Bridgeport, Conn.; Georgetown University School of Medicine, Washington, D. C., 1932; for 12 years physician for the Fairfield County Jail; physician for the state athletic commission, serving since 1947 as the official boxing commission physician in Bridgeport; on the staff of St. Vincent's Hospital; died Aug. 15, aged 55, of acute coronary occlusion.

Pruitt, Samuel Orr, Anderson, S C, University of Maryland School of Medicine and College of Physicians and Surgeons Baltimore, 1916, served in France during World War I, for four years a medical missionary to China, on the staff of the Anderson Memorial Hospital, where he died Aug 10, aged 69, of cerebral hemorrhage

Rayman, Jonas Berk Ⓜ Toledo, Ohio, University of Michigan Medical School, Ann Arbor, 1927, member of the American Academy of General Practice, veteran of World War II and was awarded the Bronze Star during the Battle of the Bulge, on the staffs of St Vincent's and St Luke's hospitals, died Aug 15, aged 57, of coronary occlusion

Rea, Ralph Waldo, Oakland, Calif, Northwestern University Medical School, Chicago, 1950, interned at the Highland-Alameda County Hospital in Oakland, served a residency at the Sonoma County Hospital in Santa Rosa and the Veterans Administration Hospital in Long Beach, died in the Veterans Administration Hospital July 30, aged 39, of bronchopneumonia due to uremia

Reese, Charles Arnold Ⓜ Weston, Mass, Harvard Medical School, Boston, 1906, veteran of World War I, died in the Newton Wellesley Hospital, Newton, Aug 2, aged 81, of pleural effusion and minimal tuberculosis

Richter, Harry Mortimer Ⓜ Chicago, born in Chicago May 17, 1872, College of Physicians and Surgeons of Chicago, 1894, member of the founders group of the American Board of Surgery, member of the Western Surgical Association, past-president of the Chicago Surgical Society, founder member of the American College of Surgeons, professor emeritus of surgery at Northwestern University Medical School, where he served as chairman of the department of surgery, at various times on the surgical staff of Passavant, Michael Reese, Wesley Memorial, and Mount Sinai hospitals, died Aug 18, aged 88, of generalized arteriosclerosis

Rieb, William Gottlieb, Parkston, S D, University of Tennessee College of Medicine, Memphis, 1935, died in the Sacred Heart Hospital, Yankton, Aug 4, aged 53, of peritonitis due to ulceration and perforation of the jejunum, chronic ulcerative ileitis, and jejunitis

Rigg, Walter A, Reading, Pa, University of Pennsylvania Department of Medicine, Philadelphia, 1895, served as chairman of the board of directors of Berks County Trust Company and president of United Power Company, formerly director of First Pennsylvania Banking and Trust Company of Philadelphia, past-president of the Trenton, N J, Railway Company and of the Wyoming Valley Public Service Company in Wilkes-Barre, staff member of the Reading Hospital, died Aug 4, aged 85, of arteriosclerotic heart disease

Robinson, G Canby, Greenport, N Y, born in Baltimore Nov 4, 1878, Johns Hopkins University School of Medicine, Baltimore, 1903, specialist certified by the American Board of Internal Medicine, member of the Association of American Physicians, of which he was past-president, past-president of the Harvey Society and the Missouri Association for Occupational Therapy, fellow of the American Association for the Advancement of Science, of which he was formerly vice-president, American Physiological Society, American Pharmacological Society, American Society of Clinical Investigation, of which he was formerly vice-president, New York Academy of Medicine, Alpha Delta Phi, Nu Sigma Nu, Phi Kappa Phi, and Alpha Omega Alpha, secretary, Section on Practice of Medicine of the American Medical Association, 1919-1920, resident pathologist at the Pennsylvania Hospital in Philadelphia from 1904 to 1906, when he became resident physician, serving until 1908, in 1909-1910 director of laboratories at the Presbyterian Hospital in Philadelphia, resident physician at the Hospital of the Rockefeller Institute in New York City from 1910 to 1912 and associate in medicine from 1910 to 1913, associate attending physician at the Washington University Hospital and Barnes Hospital in St Louis from 1913 to 1920, acting physician-in-chief at the Johns Hopkins Hospital, Baltimore, 1921-1922, physician-in-chief at the Vanderbilt University Hospital, Nashville, Tenn, from 1924 to 1928, attending physician at the New York Hospital in New York City from 1932 to 1934 and director of the New York Hospital-Cornell Medical College Association from 1928 to 1934, in 1935 visiting physician in chief at the Peiping Union Medical College Hospital in Peiping, China, where he was visiting professor of medicine in 1934-1935, associate professor of medicine at Washington University School of Medicine in St Louis from 1913 to 1920 and dean from 1917 to 1920, acting professor of medicine at Johns Hopkins University, Baltimore, 1921-1922, and lecturer in medicine in 1936, from 1920 to 1928 dean and professor of medicine at the Vanderbilt University School of Medicine in Nashville, Tenn, where in 1938 his portrait was presented on behalf of his friends, served as director of the American Red Cross Blood Donor Service during World War II, in 1947 received the Medal of Merit from President Truman for his work as head of the blood bank, formerly executive secretary and president of the Maryland Tuberculosis Association, which he served as a member of the board of directors, from 1921 to 1924 editor-in-chief of the *American Journal of Clinical Investigation*, author of The Therapeutics Use of Digitalis", in 1928 received the honorary degree of LL D from Washington University in St Louis and in 1932 the Sc D from George Washington University in Washington, D C, died in the Eastern Long Island Hospital Aug 31, aged 81, of coronary occlusion

Romaine, Frank Cleeland Ⓜ Bridgeport, Conn., Hahnemann Medical College and Hospital of Philadelphia, 1948; served a residency at the Stamford (Conn.) Hospital; veteran of World War II; physician at the Fairfield County Jail; died Aug. 21, aged 41, of myocardial infarction.

Rose, Robert Hugh, New York City; Columbia University College of Physicians and Surgeons, New York City, 1902; died Aug. 15, aged 84, of cerebral vascular accident.

Rucker, Edmund Winchester Jr. Ⓜ Birmingham, Ala.; Denver and Gross College of Medicine, 1904; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staff of St. Vincent's Hospital; died Aug. 7, aged 82, of coronary heart disease.

Rudolph, Franklin Williamson Ⓜ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1905; associated with the Dixmont State Hospital in Glenfield; died Aug. 15, aged 78, of coronary occlusion.

Savage, Raymond James Ⓜ Denver; Harvard Medical School, Boston, 1926; veteran of World War II; served as president of the staff of St. Joseph's Hospital; died Aug. 6, aged 61, of coronary occlusion and arteriosclerosis.

Schiefelbein, Harry Theodore, Welch, W. Va.; Medical College of Virginia, Richmond, 1923; past-president of the McDowell County Medical Society; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; awarded Selective Service medal for service as a medical examiner during World War II; associated with the Stevens Clinic Hospital; died Aug. 17, aged 63.

Schrock, Robert D., Omaha; Cornell University Medical College, New York City, 1912; specialist certified by the American Board of Orthopaedic Surgery; member of the American Orthopaedic Association, of which he was past-president, Western Surgical Association, Clinical Orthopaedic Society, and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; chairman of the Section on Orthopedic Surgery of the American Medical Association in 1934-1935; professor of surgery emeritus at the University of Nebraska College of Medicine; on the staffs of the Methodist, Clarkson, and Immanuel hospitals; died in Charlevoix (Mich.) Hospital Aug. 13, aged 75, of coronary thrombosis.

Shaner, Samuel Reed Ⓜ Philadelphia; Medico-Chirurgical College of Philadelphia, 1916; past-president of the West Philadelphia Medical Society, of which he was a board member; for many years treasurer of the Medico-Chirurgical Alumni Association and was recipient of the Award of Merit from that organization in 1959; died Aug. 10, aged 76, of myocardial infarction.

Shelton, Mark Anderson Ⓜ Wabbaseka, Ark.; Memphis (Tenn.) Hospital Medical College, 1908; received gold medal and certificate from the University of Tennessee College of Medicine, Memphis, on Sept. 22, 1958; on the honorary staff of the Davis Hospital in Pine Bluff, where he died Aug. 16, aged 85, of acute pyelonephritis.

Sloan, John Robert Ⓜ Garner, Ark. (licensed in Arkansas in 1903); for many years vice-president of the Citizens Bank; died Aug. 14, aged 89, of coronary thrombosis.

Watkins, James Harold Jr., Montgomery, Ala.; Tulane University School of Medicine, New Orleans, 1953; interned at the Charity Hospital of Louisiana in New Orleans; served a residency at the Ochsner Foundation Hospital in New Orleans; past-president of the Fellows Association of the Alton Ochsner Medical Foundation; on the staffs of the St. Margaret's, St. Jude's Catholic and Jackson hospitals; died in Birmingham Aug. 11, aged 34, of coronary thrombosis.

West, Charlotte Christine, Little Neck, N. Y.; Woman's Medical College of Pennsylvania, Philadelphia, 1894; died April 4, aged 95, of bilateral lobar pneumonitis.

Wilson, Edgar Nathan, Truth Or Consequences, N. M. (licensed in New Mexico in 1902); died July 1, aged 90.

Wilson, McLeod Campbell, West Hartford, Conn.; Cornell University Medical College, New York City, 1904; retired medical director of the Travelers Insurance Company; died in the Hartford Hospital Aug. 21, aged 79, of cerebral vascular accident.

Wilson, Walter Emory Jr., Fall River, Mass.; Emory University School of Medicine, Atlanta, 1939; fellow of the American College of Surgeons; veteran of World War II; member of the staff of the Union Hospital; died Aug. 7, aged 48, of coronary occlusion.

Workman, Clarence Manly Sr., Enoree, S. C.; Medical College of South Carolina, Charleston, 1912; chairman of the board of trustees of Cross Anchor High School; died Aug. 15, aged 71, of coronary thrombosis.

Yates, Earl Adelbert, Piqua, Ohio; Ohio Medical University, Columbus, 1897; veteran of World War I; formerly member of the city commission and board of education; on the staff of the Piqua Memorial Hospital; died in Medway Aug. 21, aged 86, of cardiovascular renal disease.

Yonker, William Ⓜ Chicago, Ill.; University of Illinois College of Medicine, Chicago, 1922; veteran of World War II; died Aug. 18, aged 64, of coronary thrombosis.

FOREIGN LETTERS

AUSTRALIA

Death Rates—Death rate per 1,000 of population for 1959 was 8 9 compared with 8 5 for 1958 The actual number was 89,912 The greatest single cause was heart disease (28,870) Cerebral vascular conditions were next with 11,911 deaths, followed by cancer in all forms with 10,898 Pneumonia claimed 3,529 and motor vehicle accidents 2,419 Suicide was the cause of death in 1,115 and tuberculosis in 549

Alcoholism—Dr D A Cameron, at the first Australian Conference on Alcoholism in August at the University of New South Wales, stated that $112,000,000 a year is lost to Australian industry by alcoholism Life at universities and in the service was blamed by Dr D S Fraser, Director-General of Psychiatric Services for N S W, for starting many young people on an alcoholic career Mr J O Cramer, Minister for the Army, in the Commonwealth Parliament later denied that young men were forced to drink in Army camps He called Dr Fraser's statement both unfair and irresponsible Two doctors associated addiction to alcohol with the growing use of tranquillizers and warned alcoholics against using tranquilizers without medical advice Few doctors in general practice had the necessary knowledge of alcoholism to treat it effectively, according to Dr A Fryberg of Queensland He advocated alcoholism wards in all teaching hospitals so that doctors, students, and nurses could gain an insight into the disease and the various ways in which alcoholics reacted to it Since industry has much to gain by helping to fight alcoholism, it should assist by contributions to research

BRAZIL

Blastomycosis—Dr Carlos da Silva Lacaz and co workers (*Revista Hosp Clin*) reported that coccidioidin tests on 750 adults from various parts of the country gave negative results in all but one In the same issue Dr Joao Tranchesi and co-workers reported studies with patients suffering from South American blastomycosis and treated with amphotericin B The drug stimulates the sinus node and may cause extrasystoles, especially in patients over 45 years of age The modifications of ventricular repolarization, observed in some patients during the use of the drug, suggest a toxic effect of amphotericin B on the metabolism of the myocardial fiber that is proportional to the quantity of the drug used and is reversible in a short period following cessation of treatment

CANADA

Polyvalent Somatic Antigen Vaccine—A polyvalent somatic antigen was developed which protected experimental animals against challenge with both lethal and skin-infecting doses of 36 test cultures representing all the important human phage types of *Staphylococcus aureus* The results in animals were so encouraging that preliminary trials in human beings were started Greenberg and Cooper (*Canad Med Ass J* 83 143, 1960) showed that antibodies to intracellular antigens play a greater part than antibodies to either the cellular or extracellular antigens in the prevention of staphylococcal disease In every instance, somatic antigen staphylococcal vaccines gave better protection than their homologous bacterial vaccines Toxins and toxoids played no part in the somatic antigen vaccines used in these studies since the methods for manufacture and control precluded the possibility of their presence

Polysterene latex antigens were prepared from five separate strains of different phage types of *Staph aureus* Agglutination tests on both experimental animal and human serums indicated that all of the strains had a common agglutinating antigen Two types of immunity were noted in the animal experiments Hamsters and rabbits could resist challenge with lethal doses provided they had agglutinating titers of 1 600 or greater There was no correlation, however, between the agglutinin level and resistance to intradermal infections Protection against intradermal infections was obtained only when the animals were immunized intradermally and along with intramuscular or subcutaneous injection

Psychiatric Symptoms in Fishing Village—The adult population of 274 of an island fishing village was examined for psychiatric symptoms Of these 174 or 64 per cent had some psychiatric symptoms The prevalences were highest in women in the age groups 25 to 34 and 35 to 44, in the two groups combined, 42 of the 46 showed symptoms The only age group in which women did not have a much higher prevalence than men was the group aged 45 to 54, in which the prevalence among women was 67 per cent and among men 62 5 per cent Llewellyn-Thomas (*Canad Med Ass J*, 83 197, 1960) found that the most common somatic symptoms were those connected with the gastrointestinal, nervous, and cardiovascular systems In the psychophysiological group the most common presenting symptom was fatigue, and the second most common was abdominal pain Among the fishermen the lowest prevalence was in those of average ability, and the highest prevalence among those

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The items in these letters are contributed by regular correspondents in the various foreign countries

who were either best or worst at their trade There was a lowered morbidity in old men who were able to pursue their trade

Precipitating Factors in Peptic Ulcer —The standard medical treatment of peptic ulcer attempts to heal the ulcer and to keep it healed by careful dietary regimen, antacids, avoidance of alcohol and cigarettes, and by hygienic living While this regimen is of undoubted value in the acute ulcer attack, its value in long-term treatment of ulcer is questioned by Bingham (*Canad Med Ass J* 83 205, 1960) who found that patients suffering from chronic alcoholism who ate the worst possible diets, who consumed large amounts of alcohol, coffee, and cigarettes, and who lived "irregular" lives had no more ulcers than did the general population (5 3 per cent of 430 alcoholic patients)

Patients suffering from chronic alcoholism who also had peptic ulcer had no more severe or frequent attacks of ulcer than did non-alcoholic patients Alcohol often relieved ulcer distress better than did antacids Periods of alcoholism protected some patients against recurrences of ulcer distress Psychological factors were related to the onset or recurrence of ulcer attacks in 77 per cent of 100 ulcer patients (50 with and 50 without alcoholism), whereas alcoholic excess or dietary abuse (and, by inference, coffee and cigarettes) precipitated ulcer attacks in less than 5% of the patients

Bingham noted that patients with alcoholism who had ulcers tended to be passive, dependent, "receiving" people, those without alcoholism tended to be active, independent, "giving" people Underneath this superficial layer of personality, patients in both groups were unduly vulnerable to loss of security The author concluded that better long-term results would be obtained in treatment of peptic ulcer if less attention were paid to diet, antacids, alcohol, etc, and more attention paid to psychological stress factors

GERMANY

X-ray Burns and Irradiation Sickness —A Wiskemann (*Strahlentherapie* 112 188, 1960) reported that depot ACTH suppresses erythema and ulcer formation on the skin of guinea pigs exposed to x-rays if it is applied in sufficient doses It is effective also when applied after the onset of irradiation sickness The average survival time of guinea pigs after a lethal dose of irradiation over the abdomen is increased significantly when ACTH is given for the first time after the irradiation, and when prednisolone is given for the first time 24 hours prior to the irradiation Both hormones, however, increase the death rate due to total body irradiation with sublethal and lethal doses

On the basis of these observations the author concluded that a partial suppression of the nonspecific inflammatory and general radiation reactions in human beings can be expected from ACTH medication of several weeks' duration if medication is started as soon as possible after the exposure Local treatment of the radiation reaction with 1 per cent hydrocortisone ointment decreases the x-ray erythema only if it is applied prior to the irradiation For the treatment of radiation sickness due to reactor disasters and nuclear weapons, ACTH and cortisone derivatives are contraindicated

Antidote for Parathion —W D Erdmann of Gottingen (*Deutsche med Wchnschr* 85 1014, 1960) used 2-pyridine aldoxime methiodide (PAM) as an antidote against parathion poisoning The use of this antidote does not obviate other measures, such as large doses of atropine, gastric lavage, administration of charcoal, and routine supportive treatment Intubation and artificial respiration may be indicated An intravenous injection of 0 5 Gm of PAM should be given as early as possible This dose may be repeated once after a few hours and, in severe poisoning, again after 24 hours A knowledge of serum esterase activity (using a rapid test with "Acholest" paper) is useful in deciding on the required dosage of PAM

Vacuum Extractions —J Hammerstein of Berlin (*Munchen med Wchnschr* 102 1057, 1960) used vacuum extractions in 162 (3 6 per cent) of 4,500 consecutive deliveries Because this procedure is relatively harmless, it should be more widely used when certain indications are present It could take the place of forceps extractions if the mother has pulmonary tuberculosis, heart failure, ocular disease, or preeclampsia, and if labor is prolonged In mechanical difficulties during deliveries, forceps are still preferred On the other hand, vacuum extraction may be used when the preliminary situation does not call for the use of forceps as when the head is in the pelvic inlet or the cervix is not completely dilated Although vacuum extraction is a worthwhile addition to the list of obstetrical procedures, the hazards to mother and child, though slight, must be borne in mind

JORDAN

Eye Hospital for Arabs —The Duke of Gloucester, Grand Prior of the Order of St John, will represent the Queen of England at the opening of an eye hospital for the order in Jerusalem, Jordan, on Oct 11 The hospital was built and equipped at a cost of $910,000 after a campaign for funds led by Sir Stewart Duke-Elder, the Queen's oculist and a Hospitaller of the Order An important part of the hospital's work will be research on trachoma, a disease which affects a quarter of the world's inhabitants and often causes blindness There is no known cure Training will be provided for Arab doctors and nurses The hospital will have 70 beds, and the aim is to treat 200,000 outpatients every year

During the Israeli-Arab conflict after World War II the old eye hospital was damaged and evacuated Its work continued in two old houses in the Arab district In these makeshift quarters 165,000 outpatients were treated, and 3,500 major operations were performed last year The new hospital will be the most modern in the Middle East, where eye diseases are more common than anywhere else in the world Trachoma affects 9 out of 10 children there before the age of two, and millions of man-hours are lost because of its prevalence among laborers

UNITED KINGDOM

Occupational Morbidity.—The illnesses that bring a patient to his family doctor have been studied in relation to the patient's occupation and social class by about 120 general practitioners in England and Wales The results, analyzed by the General Register Office, have been published (*Morbidity Statistics from General Practice*, vol 2 [Occupation], by W P D Logan, M D, Ph D, Her Majesty's Stationery Office) The statistics recorded are based on the numbers of consultations between patient and doctor Consequently they are not a direct measure of morbidity, because people in different occupations may feel differently inclined about consulting their doctor for the same disease, or have different opportunities to do so

The figures for employed men showed the following trends (1) in contrast to mortality, there was no social-class gradient as regards pulmonary tuberculosis, (2) the incidence of malignant neoplasms was low for farmers, miners, and shop assistants, and exceptionally high for men in personal service, (3) psychoneuroses showed a diminishing gradient from high rates in the professional class to low in semiskilled and unskilled laborers, farmers had low rates and professional workers, clerks, and foremen high rates, (4) arthritis and otitis media showed the opposite gradient as related to social class, miners had the highest rate, (5) the incidence of coronary disease was high in shopkeepers, clerical workers, and foremen and low in miners and farmers, (6) miners had almost three times as many common colds as other occupational groups, and the highest rates for acute pharyngitis, acute tonsillitis, and influenza, and (7) the incidence of peptic ulcer was above average in all manual workers, particularly foremen and transport workers, groups with a low incidence included farmers and professional workers

As regards women, the rates for those in agricultural occupations were below average, while those in non manual occupations had rates above average The rates for women classified as housewives were slightly below average

Control of Hospital Cross-Infection.—A new technique was devised by Elek and Flemming (*Lancet* 2 569, 1960) for the control of staphylococcal cross-infection in hospitals This cross-infection is the result of a cycle in which the major source of the organism is the nasal reservoir of hospital personnel and patients From this site of multiplication, staphylococci are propelled into the air and dust, whence they colonize the noses of new carriers Wound sepsis is but an incident in the cycle An observation made in 1958 suggested that the atmosphere of hospitals contains appreciable amounts of penicillin, and it was concluded that this accounts for the exclusion of penicillin-sensitive staphylococci from the noses of hospital personnel

Having determined that the nose was the main site of multiplication, the authors decided to break the epidemic cycle by spraying the wards with the new penicillin derivative, sodium 6-(2,6 dimethoxybenzamide) (Celbenin) Unlike ordinary penicillin it is active against all strains of pyogenic staphylococci No staphylococcal mutants resistant to this antibiotic appeared after 20 serial passages on gradient plates containing it Spraying the air produces droplet nuclei of the antibiotic, which circulate in the air in the same way as staphylococci An adequate concentration reaches the nasal mucosa of those breathing the air, and the cycle of circulating staphylococci is broken at its focal point, the nasal reservoir

A maternity unit was selected to demonstrate the new technique, since infants are born bacteriologically sterile and ordinarily acquire *Staphylococcus pyogenes* in the nose by inhalation The staphylococcal nasal carriage of the infants in both wards was over 50 per cent of 290 swabs taken over a period of 10 days, and all but one of the strains were resistant to ordinary penicillin The ward was sprayed four times daily with 1 Gm of this new synthetic penicillin This reduced the nasal carriage rate of the babies from 50 to 2 per cent and reduced the staphylococci present on the umbilicus and in the rectum Instead of being colonized by staphylococci the babies harbored coagulase-negative micrococci and gram-negative flora Spraying was continued for six months, and during this period only 14 minor staphylococcal lesions, mostly blepharitis and pimples, occurred in 340 babies

After six months' spraying of the wards, the dust was found to have an inhibitory action on staphylococci corresponding to 200 mcg per gram of the penicillin derivative The antibiotic seemed to meet all the requirements for a drug used to spray the wards It is highly bacteriostatic and bactericidal to *Staph pyogenes*, and droplet nuclei retain their action No such side effects as irritation or hypersensitivity occurred in the babies, mothers, or nurses, and no resistant strains were encountered The authors believed it highly unlikely that Celbenin-resistant staphylococci would emerge in the future Heretofore, when infants left the hospital they carried in their noses the prevalent hospital staphylococci, which frequently caused breast abscesses and other infections in the home The new technique should prevent this

Increased Pay for Health Service Doctors —More pay for physicians and a better National Health Service for patients should result from new proposals They provide nearly $112,000,000 in increases and retroactive payments to be distributed among about 40,000 hospital and family doctors About 22,000 family doctors will receive an average increase of $17 a week This will bring their average annual pay to $7,762 The new increases will be payable from Jan 1, 1960 General Medical Services Committee, which negotiates for the family doctors, urges them to pass on part of their back pay and increases to their assistants

In the hospital field, the 100 top consultants will in future receive $22,120 a year, or a salary of $10,920 plus one of the 100 new distinction awards of $11,200 a year There are about 7,000 consultants

The new deal for patients is in less precise terms than the pay increases for doctors A novel and outstanding proposal is that $2,800,000 a year should be set aside so that further consideration can be given to methods of making the best possible general medical service available to the public The aim is to improve standards of general practice It would seem to involve incentives of some kind The proposal is endorsed by the General Medical Services Committee as a wise and statesmanlike action A British Medical Association spokesman said that the object was to find some scheme which would make for a still better general practitioner service

The fee paid for each patient on a doctor's list is left at $2 80 The profession is anxious to improve maternity medical services For complete maternity services by a doctor on the obstetric list, the fee will be increased from $21 00 to $35 50 For doctors not on the list the increase is from $15 00 to $20 60 The fee for treating temporary residents is increased from $2 52 to $2 80 This is an important source of income for some seaside physicians

Identification of Virulent Types of Bacteria —A new test which will rapidly identify most of the virulent bacteria responsible for hospital infections was described by Dr B Moore (*Lancet*, Aug 27, 1960) Cross-infection is caused by epidemic staphylococci, which are resistant to penicillin and other antibiotic drugs It was observed that strains of bacteria which were resistant to antibiotics were also more resistant to mercuric salts They were staphylococci of types known to cause epidemic hospital infection The new test discriminated between epidemic and non-epidemic bacteria

The test picked out some organisms, for the rapid recognition of which no other laboratory test is at present available It identified most of the major hospital organisms within 24 hours, as against two or more days when conventional laboratory tests were used The lead to the test was given by A M N Gardner, surgeon and infection-control officer at Torbay Hospital where wound infections were being investigated Mr Gardner suggested that the catgut in the wounds of the patients might have been digested by the infecting staphylococci

In experiments which followed, catgut was immersed in actively growing cultures of epidemic staphylococci An inhibitory effect against some strains, but not against others, was found The catgut had been treated with an alcoholic solution of mercuric iodide The investigation of hospital outbreaks of staphylococcal infections has until now been greatly hindered by the lack of laboratory tests for rapidly identifying strains likely to cause epidemic infection The new test was successfully used for direct isolation of epidemic staphylococci from swabs and wound specimens, and from the hospital environment, blankets, and ward and operating-room air

Duodenal Ulcer —Dr S C Truelove of Oxford (*Brit Med J*, Aug 20, 1960) treated 80 patients who had chronic duodenal ulcers with diethylstilbestrol, phenobarbital, and an "ulcer diet" The trial was conducted as an experiment in which all eight possible combinations of the three agents were used within the framework of a randomized block design The trial period lasted six months, and the subjects were then kept under observation for another five years Neither phenobarbital nor diet had any material influence on either the short-term or the long-term course of the disease, but the hormone had a beneficial effect on both The beneficial effect of diethylstilbestrol was chiefly evident in those subjects who had had an ulcer for less than 10 years In such subjects treated with the hormone, prolonged clinical and radiological cure was more than twice as common as in the controls, while surgical treatment was judged to be necessary in only one-third as many

The radiological findings at the end of the trial period were found to furnish an excellent general guide to the future clinical and radiological course of the disease The possible use of diethylstilbestrol as a practical form of therapy probably depends on whether equally good results can be obtained with a shorter course of treatment to minimize side-effects of therapy There is, however, the more promising possibility that steroidal analogues with minimal feminizing powers but equally beneficial healing properties can be found For the present, this whole approach to the treatment of chronic duodenal ulcer should be regarded as experimental

CORRESPONDENCE

TEETH AND THE EUSTACHIAN TUBE

To the Editor —The filler in THE JOURNAL, July 30, page 1470, begs for comment lest misinformation be perpetuated We refer to the quotation from MacBeth (*Proc Roy Soc Med*, March, 1960) MacBeth deduces that 'earache of teething infants is often due to a minor otitis media The pink drumhead occurs too often to be ignored and this may mean an otosalpingitis of lymphborne origin' It should be borne in mind that infection does not generally accompany teething in infants, that the teeth cannot be infected before being erupted, and that they have not yet had a chance to become decayed, let alone become infected, in an infant

MacBeth commits another error in deducing that "periodontal sepsis," by which it is presumed is meant periodontitis or periodontosis, causes deafness in the adult Were this so, a very high percentage of adult patients would be deaf, as both these conditions are not uncommon in people past middle age Furthermore, it has not been demonstrated that "extraction of the offending teeth cures the deafness"

Finally, when the extract was edited, several words and the paragraph indentations were omitted This device attributes to Professor M Wharton Young conclusions never made by him and wholly foreign to his work

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DIURETICS AND CARDIAC INSUFFICIENCY

To the Editor —In an article entitled 'Regulation of Electrolytes in the Management of Heart Disease' in THE JOURNAL, April 30, page 2046, Dr Elliot V Newman asserts that the basic treatment of congestive cardiac insufficiency consists of digitalization, dietary restriction of sodium, and reduction of physical activity He deprecates the use of diuretics because of their electrolyte-deranging actions and development of refractoriness

There are two phases to the pathologic physiology of congestive cardiac insufficiency (1) primary system—incompetence of the hydraulic or circulatory system, and (2) secondary system—metabolic derangements which are a direct result of the primary system and which consist of the accumulation of sodium and water This acts as an impediment to the circulation Treatment of the primary system by digitalization, dietary restriction of sodium, and rest produces only a modicum of improvement in the average moderately severe or severe case of congestive heart failure At this point, administration of diuretics, with the resultant outpouring of sodium and water, produces a rapid increase in cardiac reserve with a dramatic decrease in the signs and symptoms of cardiac insufficiency The converse of this is also true If a patient with severe, congestive heart failure who is seen for the first time is given 2 cc of meralluride, a striking improvement of cardiac function occurs Digitalization, at this point, adds little to the improvement The extent of improvement in cardiac function as a result of the administration of diuretics, unaided by digitalis, is so great that the fundamental conclusion must be drawn that the secondary metabolic manifestation—that is, the accumulation of sodium and water—is far more potent in the production of congestive cardiac insufficiency than the primary system—that is, cardiac incompetence itself In summation it may be said that the sovereign remedy for congestive cardiac insufficiency is diuretics and that digitalis occupies only an ancillary position

The parenteral mercurials (meralluride, mercaptomerin) and the derivatives of benzine-disulfonamide (hydrochlorothiazide, hydroflumethiazide, flumethiazide, benzydroflumethiazide) are by far the most powerful and the most widely used diuretics If the dosage is carefully regulated, these diuretics do not, even on long-continued use, produce any important disturbance in electrolyte homeostasis, nor does tolerance or refractoriness develop

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HOSPITALS WITHOUT AVAILABLE HOUSE STAFFS

To the Editor —In THE JOURNAL, July 16, page 1272, there was a communication from Dr M H Mufson, of Denville, N J, who was quite concerned about working in the hospital without a resident staff Perhaps he can be encouraged by the experience which we here in Orange County, Calif, have had

In this area there are approximately 10 hospitals for the care of private patients Several of these are nonprofit institutions There is also one large county hospital, which is a teaching institution None of the hospitals for private patients has a resident or intern staff. We feel that the standard of medical practice in these hospitals is equivalent to that in the teaching institutions. Teaching at one of the medical schools in Los Angeles provides me with the opportunity to compare facilities in the suburbs with those in a large city.

The services which might otherwise be rendered by the resident staff are handled as follows. The laboratory work in our hospitals is done by technicians. The intravenous injections are started by either nurses or any doctor who may be in the hospital. The emergency rooms are covered by practicing physicians interested in this type of service. They are on call for a week at a time. For assistants, the surgeons use other practicing physicians, who have more experience than interns. Our histories are prepared in the office, and for this reason we think they are more complete than those which could be written by an intern or extern the night before surgery. After all, some of these patients have been seen in the office for weeks or months and may have had many examinations and roentgenographic studies. The intern would not have access to the complete records and thus would not know exactly what had developed to bring about a decision to operate.

It appears at this time that the gradual development of hospital practice is leading in the direction of a house staff for hospitals which are truly designed and oriented for teaching and with increasing responsibilities for interns and residents. More and more of the nonteaching hospitals are being handled capably and efficiently by practitioners in private practice.

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GENERIC NAMES AND TRADE NAMES

To the Editor:—The editorial, "What's in a Name?," which appeared in The Journal, Aug. 6, page 1580, recommending wider use of generic names, contains a number of interesting facts but omits mention of some rather important considerations. The trade name of a drug represents a very substantial contribution of time and effort given to chemical, pharmacological, and clinical research. The owner of that trade name, in his own self-interest, must protect that investment by rigid quality controls, so that every tablet or teaspoonful will have exactly the same ingredients, the same physical characteristics, and, therefore, the same pharmacological action as every other tablet or teaspoonful. In contrast, many purveyors of drugs under generic names are under no such compulsion, since they sell mainly to those who want "something just as good—only cheaper."

The physician who purchases an automobile, an air conditioner, a shirt, or even a pack of cigarettes for his own use almost invariably chooses a brand that he knows. Why? He realizes that a risk is involved if he buys, simply by generic name, something that does not have well-known standards. Even a little thing like a clinical thermometer is purchased because his experience dictates the reliability of certain brands.

A physician who ignores his own experience as to the reliability of well-known brands and prescribes by generic name introduces an unnecessary additional factor into the evaluation of his therapy; he cannot really be sure exactly what the patient is taking because the pharmacist has the option of obtaining the substance from any source, even the very cheapest. (The editors of *Medical Letter* recently found all "name" brands of prednisone to be within USP standards, whereas 4 of 29 unbranded products failed to meet those standards.)

The patient who has shopped around for the lowest price on his generic prescription does not know whom to blame for any failure of therapy. However, his first guess will probably be his doctor. In addition, the conscientious pharmacist is placed at a disadvantage vis-a-vis his unscrupulous cut-rate competitor. Thus, from a practical standpoint, the writing of prescriptions by generic name may often prove disadvantageous to the physician, the patient, and the conscientious pharmacist.

J. H. Walton, M.D.
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USE OF FIRST-PERSON PRONOUNS

To the Editor:—It strikes me that there are remarks which are open to question in the extract at the bottom of page 1861 in the Aug. 20 issue of The Journal. Speaking with whatever authority a number of rejection slips and few acceptances might indicate, I can say that many an otherwise dull story has been enlivened by its first-person pronouns. It is true that medical writing is not creative in the same sense as such writing as Poe's short stories, for instance. Its frequent dull and uninspired composition attests to this with drab eloquence. Still, it should be, and some of the medical classics indicate that it can be. Turn to these and notice that their most delightfully refreshing feature is usually a style which makes liberal use of "my," "I," and "me." Indeed, the "once-upon-a-time" approach is as insufferably dull and archaic as it is childish and trite.

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Muncie Clinic
Muncie, Ind.

BOOK REVIEWS

Modern Nutrition in Health and Disease Dietotherapy Edited by Michael G Wohl M D, Chief of Human Nutrition Division of Biological Chemistry, Hahnemann Medical College and Hospital Philadelphia, and Robert S Goodhart M D Scientific Director, National Vitamin Foundation New York 59 contributors Second edition Cloth $18 50 Pp 1152 with 75 illustrations Lea & Febiger Washington Sq., Philadelphia 6, 1960

The second edition of this book contains the same three sections used in the original edition (1) "Normal Nutrition", (2) Nutrition in Disease , and (3) "Nutrition in Periods of Physiologic Stress' New material has been added, bringing the views presented in line with the research of the past five years Two additional sections have been added "Chemical and Other Additives to Foods' and "Nutrition in Relation to Atherosclerosis' Recent public concern on these subjects would appear to make their inclusion an important addition to a general reference on nutrition and health Magnesium has been given increased space as a specific section along with calcium and phosphorus This reflects the results of research and new evaluation of the data on this topic

As a general reference the book offers information on all of the topics important to the physician and nutritionist seeking basic facts Through the references given, additional information can be obtained on specific subjects Readability is a problem in many books written by a large number of authors In going from one section into another, the change in style often reduces reader interest Some sections contain passages expressing a given author s personal views with the detailed references found in a discussion of some other area As a ready reference this new edition presents up-to-date information on questions of nutrition and health and points out the relationship of nutrition to certain diseases

OGDEN C JOHNSON, Ph D

Surgery of Repair as Applied to Hand Injuries By B K Rank C M G, M S F R C S, and A R Wakefield M S F R C S F R A C S Foreword by Sir Gordon Gordon Taylor K B E C B LL D Second edition Cloth $9 Pp 284 with 219 illustrations Williams & Wilkins Company 426 E Preston St Baltimore 2 E & S Livingstone Ltd, 15 17 Teviot Pl, Edinburgh 1 Scotland 1960

This is a comprehensive treatise on hand trauma written by two Australian plastic surgeons and based on a wide military and civilian experience It is written with clarity and is superbly and thoughtfully illustrated The book covers all aspects of hand injuries It assumes a certain basic knowledge of surgery, particularly orthopedic surgery, and is meant primarily for the "discriminative interest of those who see and treat hand injuries"

The social significance of hand injuries is discussed with emphasis on their prevention The responsibility of the medical profession toward the patient s welfare is well summarized "It is essential that the surgeon remain a free agent with an unfettered doctor-patient relationship He must certainly collaborate with employer and insurer, but should be subservient to neither'

The surgical anatomy is briefly discussed from the standpoint of function and variation in hand types and their possible application to repair I would take slight exception to the authors statement that major hand sepsis has become a rarity and that knowledge of the pathways of sepsis is of minor interest Anyone performing hand surgery should know the total anatomy of the hand in its relation to all diseases Even if hand infections are diminishing, it is essential that their anatomy be stressed or it will be forgotten

A chapter outlining a thorough history and systematic examination of an injured hand with a review of the diagnostic pitfalls is a perfect gem The authors classification of injuries into "tidy and 'untidy wounds with their discussion of the distorted surgical anatomy and treatment of the various subtypes is the heart of the book and is a sound presentation of the many facets of repair The plastic principles involved in wound closure are presented with utmost clarity The principles of the other soft tissue injuries are equally sound and brook no disagreement

The section devoted to secondary treatment is particularly valuable and is prefaced by the authors philosophy The physical deformity is assessed, and the plan of treatment is based on the usefulness that is present combined with a general survey of the patient s age attitude, and employment It is unfair to commit any patient to equivocal surgery which, though academically interesting, holds no real economic prospect for him"

The various aspects of secondary treatment of hand injuries with relation to scar disabilities and tendon grafts, including the indications and techniques of the various procedures, is probably more ably presented than in any other work on the subject I would take issue with the authors' condemnation of nerve end ligation in amputations My experience with digital amputation neuromas convinces me that Monro s method of lightly crushing the nerve a short distance proximal to the cut end and ligating this partially crushed area with a nonabsorbable silk suture is a valuable addition to placing the nerve end in an area where it will not be caught in scar or subjected to constant trauma

An excellent chapter on children's injuries emphasizes many aspects with particular reference to rapid healing, capacity for remodeling tissue, and the effects of epiphyseal injuries

The text of this second edition is essentially the same as the first, but over 30 new illustrations improve the presentation The book is beautifully bound and printed with easy read type on fine quality paper The illustrations are clear and each one demonstrates a definite point or issue This book should be in the library of every surgeon interested in the treatment of hand injuries

JOHN J BYRNE, M D

Practical Proctology By Louis A Buie, Sr, M D, F A C S Second edition Cloth $22 50 Pp 737, with 280 illustrations Charles C Thomas, Publisher, 301-327 E Lawrence Ave, Springfield, Ill, Blackwell Scientific Publications, Ltd, 24-25 Broad St, Oxford, England, Ryerson Press, 299 Queen St, W, Toronto 2B, Canada, 1960

Dr Buie has devoted 40 years to the practice of proctology, and this book is a revision of the first edition which was published in 1937 The many changes that have come about in this specialty since 1937 have been incorporated in this new volume, but the basic knowledge that was contained in the first edition has been retained This is an excellent textbook having to do with diseases of the anus, anal canal, and rectum that should be of value to the clinician, surgeon, and medical student The author's description of tumors of the colon is good, but he has not entered into a discussion of the modern surgical treatment of malignant disease

J EDWIN ALFORD, M D

Recent Advances in Biological Psychiatry, Including a Havelock Ellis Centenary Symposium on Sexual Behavior Edited by Joseph Wortis, M D, Associate Clinical Professor of Psychiatry, State University of New York, Downstate Medical College, Brooklyn Proceedings of fourteenth annual convention and scientific program of Society of Biological Psychiatry, Atlantic City, June 1959 Cloth $13 50 Pp 417, with illustrations Grune & Stratton, Inc, 381 Park Ave S, New York 16, 15/16 Queen St, Mayfair, London, W 1, England, 1960

The Society of Biological Psychiatry has achieved an important position in the total field, as it represents a special frame of reference to the problems of mental illness Without pretending that this position enables man to find all the answers, but maintaining that the biology of man is an essential area of study for mental illness, the Society has established a sound scientific position The present volume includes 27 papers on neuroanatomy, neurophysiology, electroencephalography, drug and somatic therapy, and psychopharmacologic research Most of these are excellent The essayists are distinguished investigators, the papers are all worth reading, and the book is highly recommended

ROY R GRINKER, M D

Modern Scientific Aspects of Neurology Edited by John N Cumings, M D, F R C P, Professor of Chemical Pathology, Institute of Neurology, The National Hospital, Queen Sq, London, England Cloth $13 Pp 360, with illustrations Williams and Wilkins Co, 428 E Preston St, Baltimore 2, Edward Arnold, Ltd, 41 Maddox St, London W 1, England, 1960

An excellent research book has been compiled by the chief editor who has chosen several well known European investigators to assist him in the writing The organization of the contributions is good, and it is most significant that the first chapter is on nucleic acids, reflecting a trend not only general but now more specifically related to neurology In additional sections is a discussion of nerve endings in striated muscles, lipidoses in the central nervous system, histochemical approach to the study of demyelinating diseases, electron microscopy, x-ray diffraction analysis, glycerophosphatides and spingolipids, esterases, epileptic and convulsive entities, and additional lipid chemistry The illustrations are outstanding The printing has been so good that one is actually able to distinguish and to judge with comparative ease the various histochemical stains, which have also been discussed in the text The references are current, and the index appears suitable for the demands of most physicians

LAWRENCE C PARISH

Newer Virus Diseases Clinical Differentiation of Acute Respiratory Infections By John M Adams, M D, Ph D, Professor and Chairman, Department of Pediatrics, School of Medicine, University of California at Los Angeles Cloth $5 75 Pp 292, with 18 illustrations The Macmillan Company, 60 Fifth Ave, New York 11, Brett-Macmillan, Ltd, 132 Water St, S, Galt, Ontario, Canada, 1960

Recent advances in virology related to acute infections of the respiratory tract are described in this excellent monograph The remaining chapters consider differential diagnosis of the variety of specific respiratory infections and these greatly enhance the worth of this volume to the practicing physician The format is well conceived, and illustrations are clear and informative There is a certain amount of repetition in the text, but this is not obvious when it is used as a reference work The chapters on basic concepts, myxovirus infections and adenovirus and enterovirus diseases are particularly good The chapter summaries are useful and well done The references are pertinent and many are current This book can be recommended without hesitation, it should be of value to those who use it even after the "newer" aspect of its title no longer applies

JAMES A CURTIN, M D

ABSTRACTS FROM THE LITERATURE

Archives of Environmental Health

1 377-460 (Nov) 1960

Public Protection in an Open Exhibit of Radioactivity
W B Harris p 377
*Clinical and Roentgenological Study of Kaolin Workers
R W Edenfield p 392
*Treatment of Severe Parathion Poisoning with 2 Pyridine Aldoxine Methiodide (2-PAM)—A J Funckes p 404
*Patch Test Study to Determine Cutaneous Reaction to New Compounds—J V Klauder p 407
*Fatal Gassing in an Acetylene Manufacturing Plant
A T Jones p 417
Fate of Inhaled Particles in Early Postexposure Period
C W LaBelle and H Brieger p 423
*Problem Areas in Pneumoconiosis
M Kleinfeld and J Messite p 428
*Industrial Hygiene of Uranium Refining
E Christofano and W B Harris p 438

Study of Kaolin Workers—This study was made in the kaolin industry to determine the effects of kaolin dust on the health of the workers The general health of those working in this industry did not differ significantly from that of the general population Heavy dust exposure over many years produced radiographic evidence of pneumoconiosis in 44 of the 1 100 workers examined Of these 31 showed only fine discrete nodulation without hilar enlargement or fibrosis These lesions represent focal collections of dust in the alveoli or lymphatics and were not progressive over a period of years Seven workers showed moderate fibrosis in the upper lobes 6 others showed advanced fibrosis and emphysema similar to that seen in coal miners This study suggests that these advanced lesions represent the combined effect of tuberculosis plus heavy dust exposure

Parathion Poisoning and 2-PAM (2-Pyridine Aldoxine Methiodide)—A 29-year-old flagman who was suffering from respiratory difficulty, clonic convulsive movements incontinence, disorientation, and other typical signs of parathion poisoning was growing worse in spite of treatment with atropine He improved dramatically following the slow intravenous injection of 1 0 Gm of 2-PAM (2-pyridine aldoxine methiodide) The patient became rational, convulsive movements ceased, and excessive salivation and perspiration stopped Recovery was uneventful

Patch Test Study of Cutaneous Reaction to New Compounds—This study essentially concerns the repeated-insult method of patch test Repeated applications of the tested material are made every other day, or 3 times weekly, for a total of 12 consecutive applications The tested material remains on the skin for 24 hours and is again applied to the same site as the prior application The challenging application is made 2 weeks after the last of the consecutive applications That concentration of the tested material is used which does not exert primary irritant action The appearance of primary irritant reaction after prior negative reaction represents an accumulative irritant action and is termed fatigue reaction The latter is believed to represent the dermatitis potential of the tested substance in actual use Tables are shown illustrating fatiguing and allergic reactions of different materials tested The repeated-insult method is regarded as more capable of detecting sensitizing substances than is the method of detecting them by prophetic patch test comprising 2 applications

Fatal Gassing in Acetylene Plant—A fatal accident during the routine manufacture of commercial acetylene gas was investigated in March, 1959 The operator had been found in the early hours of the morning slumped over a carbide hopper above the generator, with his head in the filler hole Postmortem examination revealed parchment abrasions pulmonary edema and 8 per cent carboxyhemoglobin in the blood Concentration of oxygen as low as 8 per cent in the atmosphere of the hopper was found, concentrations of acetylene up to 80 per cent occur in the hopper Sampling was not carried out in the hoppers owing to the possibility of explosion Giving consideration to the known effects of lack of oxygen and of exposure to high concentrations of acetylene, it is felt that for some reason (it was difficult to see the level inside hoppers if the calcium carbide was low) the operator placed his head in, or extremely closely over the open hopper In doing so he was exposed to an atmosphere deficient in oxygen and having a high concentration of acetylene This probably caused his collapse Death subsequently would have been due to breathing this atmosphere, including the impurities in the acetylene

Problem Areas in Pneumoconiosis—Establishment of causal relationships, evaluation of disability and medicolegal factors were discussed as 3 major problem areas associated with pneumoconiosis Determination of causal relationships must be predicated upon adequate detailed information about industrial environments, coupled with a complete knowledge of the dust diseases To emphasize the importance of this point cases were cited illustrating the need of knowing the size and physical characteristics of airborne particulates details of workers jobs, the epidemiology, incubation period and the differential diagnosis in instances of pneumoconiosis Since no single approach is consistently valid and reliable for evaluating disability in an individual case, the combined use of clinical, radiographic, pathologic and physiologic methods of examination was described as essential for proper evaluation of disability Legal concepts of disability, limitation of compensation to total disability and time limits for filing claims were discussed as relevant medicolegal aspects

Industrial Hygiene of Uranium Refining—From 1948 to 1959 the Atomic Energy Commission, as sole consumer of uranium, maintained an intense interest in health protection of workers involved in this industry For much of this period the Health and Safety Laboratory has been responsible for compiling information pertaining to occupational exposure to health hazards associated with refining of uranium metal from ore Approximately 60 studies have been conducted at 7 production facilities Obligation to maintain satisfactory

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Titles marked with an asterisk (*) are abstracted

environmental conditions began when toxicity of uranium was a matter of controversy Original estimates on allowable air concentrations have been revised downward, but comprehensive medical programs at all production facilities have not uncovered occupational disease associated with uranium refining even in persons exposed to many times present maximum permitted dosage The history of uranium production is reviewed, and occupational exposure is correlated with control methods then in effect Sources of contamination are identified, and recommendations for their control are set forth Transportation, storage, handling of materials, and waste-disposal problems unique to the industry are discussed Original production facilities, activated by Manhattan District, were constructed hastily and on a temporary basis Adequate supervision was complicated by the fact that production sequences were performed in widely scattered plants Production network included a sampling plant in New Jersey, refining steps in St Louis, Buffalo, and Cleveland, metal production in St Louis and Buffalo, and scrap recovery in Pittsburgh Highest dust exposures were encountered in packaging dry material for shipment to the succeeding facility It was not until basic processes were consolidated in 2 integrated production centers, eliminating many dry transfer steps, that industrial hygiene control was satisfactory Formerly occupational exposures were often thousands of times the presently acceptable maximum, but in recent years only rarely have permissible levels been exceeded Inhalation exposure to uranium-bearing dust was the most thoroughly studied hazard, but air concentrations of explosive atmospheres, acid mists, radon gas, and exposure to penetrating radiation were also investigated

Archives of Pathology

70 529-642 (Nov) 1960

°Architecture of Conduction System in Congenital Heart Disease—M Lev p 529
°Air-Flow as Etiologic Factor in Metaplasia in Tracheobronchial Tree—A C Hilding p 550
°Mixed Tumor, Salivary Gland Type, of Deep Fascial Region of Thigh—F R Dutra p 562
°Carrageenin Granuloma in Guinea Pig and Rat E R Fisher and J Paar p 565
°Granuloma of Brain Probably Due to Endolimax Williamsi (Iodamoeba Butschlii)—J W Kernohan and others p 576
Urinary Excretion of Alkaline Phosphatase Following Renal Ischemia in Rats—J H Lunseth p 581
°Plasma Cell Maturation in Arthus Lesions of Lymphocyte-Depleted Rabbits—D D McGregor and others p 592
°Zonal Renal Papillary Droplet Change with Potassium Depletion—B Spargo, F Straus, and F Fitch p 599
°Encephalomyelitis, Myocarditis Adrenal Cortical Necrosis in Coxsackie B3 Virus Infection—J Moossy and J C Geer p 614
Secondary Hemochromatosis Its Association with Anemia G Kent and H Popper p 623
°Stretch Capacity of Component Layers of Aortic Wall D L Weiss and R Linde p 640

Conduction System in Congenital Heart Disease—The AV node, bundle, and bundle branches of 6 hearts with ventricular septal defect were studied by quantitative skip-serial sections Four of these cases were isolated ventricular septal defect complexes, 1 was that of ventricular septal defect with partial anomalous pulmonary venous drainage, and 1 with fetal coarctation The AV node was normal in position, except where the defect was exclusively in the pars membr that area of septi or where there was a left superior vena has establish to the coronary sinus The AV bundle was present volum sterior (inferior) rim of the defect, where anatomy, neurop aortic The bifurcation was on the pos- drug and somatic distal wall of the defect The right bed the distal wall of the defect, or proceeded directly to the septal band The position of these structures in ventricular septal defect is related to their embryologic relationship to the posterior endocardial cushion and the posterior ventricular septum

Air-Flow in Metaplasia in Tracheobronchial Tree—This study was made to determine if metaplastic changes in the respiratory epithelium of the tracheobronchial tree are due to the impact of inflowing air The squamous epithelium in the nose is obviously related to air-flow Since the air is conditioned and velocity of flow reduced in the lower tract it seemed unlikely the metaplastic changes found there are caused by the impact of inflowing air Three areas of epithelium where impact might vary were studied in routine autopsy material (1) crest of coryna compared with wall of main bronchi, (2) medial wall of left main bronchus vs medial wall of right, (3) medial wall of left upper lobe compared with lateral The findings did not support the view that the impact of air-flow causes these metaplastic changes Other methods and techniques might do so

Mixed Tumor of Deep Fascial Region of Thigh—Mixed tumors resembling those which occur in the salivary glands also occur in the skin, where, presumably, they are derived from sweat glands One such tumor has been reported arising in connection with the deep fascia of the lower extremity, and the present paper reports a similar case in this location The tumors are benign in appearance, surrounded by a pseudocapsule, and excision is curative

Carrageenin Granuloma in Guinea Pig and Rat I—The subcutaneous injection of carrageenin (Chondrus extract N F), a highly sulfated polygalactose, in guinea pigs and rats resulted in granuloma formation characterized by maximum production of collagen at 15 days The latter subsequently underwent degenerative changes and was replaced by adult adipose tissue at 45 days The fibrillogenesis observed following administration of carrageenin differed from that observed in healing wounds in that histochemically demonstrable acid mucopolysaccharide of the ground substance was not observed Depletion of mast cells in rats with compound 48/80 failed to influence the reaction of carrageenin in this species Hydrocortisone and estradiol did not qualitatively alter the reaction to carrageenin although quantitatively it was less in animals treated with the former and greater in animals receiving the latter agent than in untreated controls

Granuloma of Brain Probably Due to Endolimax Williamsi—A chronic granuloma found in the brain of a 6-year-old child was caused by *Endolimax williamsi (Iodamoeba butschlii)* This chronic inflammatory lesion probably followed trauma to the scalp Amebas were not found in other tissues The amebas were characteristic and were differentiated from other amebas and from the cells of cytomegalic inclusion disease The granuloma was progressive and caused death in 13 months *Endolimax williamsi* is ordinarily nonpathogenic However, under proper circumstances, this protozoan apparently can produce a fatal granulomatous lesion

Plasma Cell Maturation in Arthus Lesions—The purpose of this investigation was the study of the differentiation of primitive mesenchymal cells and their development into mature plasma cells in tissues practically devoid of lymphocytes This situation was created by means of whole body radiation (1,200 r) of hyperimmune rabbits whose peripheral blood showed an almost total absence of lymphocytes, a finding confirmed by a study of the morphology of their splenic pulp Induction of Arthus lesions by intracutaneous antigenic stimulation before or after the application of radiation was shown to be associated with an undisturbed sequence of plasma cell maturation It was consequently suggested that intact lymphocytes were not a necessary component in the maturation differentiation sequence of mesenchymal cells in the direction of immunologically competent cells

Renal Papillary Droplet Change with Potassium Depletion —Striking morphologic renal changes pathognomonic of potassium depletion in the rat include a conspicuous hyaline droplet change in the papillary tip The significance of this droplet change has been the source of recent speculation This study, which combined fluorescent and electron microscopy presents significant observations on the nature and location of these droplets It demonstrates a complex ultrastructural pattern which makes it unlikely that they are related to mitochondria The protein portion of the droplet is shown to be acquired late in its formation The presence of the papillary droplet change in all cells in the involved area and their distribution in a zonal pattern similar to the osmotic gradient proposed by the advocates of the countercurrent hypothesis is evidence that this is a change in the cytoplasmic state produced by electrolyte imbalance

Encephalomyelitis, Myocarditis, Adrenal Cortical Necrosis in Coxsackie B3 Virus Infection —Clinicopathologic study of a child of 4 days old demonstrated lesions in the central nervous system myocardium, and adrenal cortex Virus isolation studies yielded *Coxsackie B3* Special attention was given to the distribution and type of lesions in the nervous system and comparisons were made with 14 cases in the literature Lesions were maximal in the brain stem, especially in the inferior olivary nuclei, and in the first cervical segment of the spinal cord They appeared as clusters of mononuclear phagocytes, proliferative rod cell forms, and, rarely neutrophilic leukocytes limited almost exclusively to grey matter Perivascular lymphocytic infiltrations were evident in the same areas The occurrence in the neonatal child of encephalomyelitis with maximum lesions in the brain stem, myocarditis, and adrenal cortical necrosis strongly suggests Coxsackie virus infection

Stretch Capacity of Component Layers of Aortic Wall —The capacity to stretch of the separated intimal, elastic, and medial coats of 112 normal aortas was measured, and the relationships between coats were calculated The intimal-subintimal complex was shown to be relatively rigid, the internal elastic lamella having about 3 times the capacity of the intima to stretch The elastic coat had ⅓ greater capacity to stretch in the *transverse axis of the vessel than in the long axis* The medial coat approached the values for the elastic layer How does rigid intima accommodate to changing diameters during aortic pulsation without rupture? It may either ripple or undergo helical torsion

British Medical Journal, London

2 327-406 (July 30) 1960 Partial Index

*Diagnosis and Treatment of Renal Artery Stenosis
J J Brown and others p 327
Spironolactone and Hydrochlorothiazide in Treatment of Edema—R O Farrelly and others p 339
Multiple Sclerosis
H Miller A Ridley and K Schapira p 343
*Pretibial Myxedema
T M D Gimlette p 348
Retinitis Pigmentosa, Hypertension and Uremia in Werner s Syndrome—A Valero and B Gellei p 351
Treatment of Chronic Furunculosis
L G Tulloch V G Alder and W A Gillespie p 354
*Hemopentoneum in von Willebrand s Disease
A A Sharp and H Ellis p 356

Diagnosis and Treatment of Renal Artery Stenosis —Some patients with renal artery lesions and severe hypertension may be greatly improved by operations that correct the stenosis The authors define the diagnostic criteria on the basis of observations on 22 patients in whom renal artery disease was proved or strongly suspected, and 11 of whom were operated on Stenosis of the renal artery should be considered in any patient whose hypertension is otherwise unexplained The presenting symptoms are not necessarily helpful A systolic bruit over the affected artery is frequently present The intravenous pyelogram often shows a better contrast on the side with the stenosis, but reduced urine flow The affected kidney may also be smaller than its fellow In a few cases the pyelogram shows impairment on the side with the lesion The diagnosis of renal artery stenosis as a cause of hypertension cannot be based on a single investigation Ureteral catheterization and renal arteriography are the most valuable investigations, and are complementary rather than rival Arterial pressure should always be measured at operation, and the reconstructive result should be checked by measurement at the completion of the procedure Surgery should not be carried out unless there are definite indications for it Many patients with renal artery stenosis have widespread arterial disease and are not fit to withstand a prolonged operation Occasionally nephrectomy is advisable, but more often the affected kidney is potentially the better one and must be preserved if possible

Pretibial Myxedema —Of 280 patients with thyrotoxicosis 12 either had pretibial myxedema or it developed later Since transient lesions may have been overlooked, the true incidence was probably over 5% The authors describe observations on 23 patients (4 men and 19 women) The earliest stage of pretibial myxedema was a shiny red plaque, usually on the anterolateral side of the lower half of the leg Several lesions often appeared simultaneously they might progress no further, might regress, or the plaques might enlarge and grow together Often coarse hair grows and excessive sweating occurs in the area of the lesions, occasionally lichenification and scaling occur In the 4 most severe cases the lesion involved most of the skin up to the knees, giving the appearance of elephantiasis Biopsy is undesirable Histologically, pretibial myxedema is characterized by edema of the corium, which contains a substance, staining like mucin separating the collagen fibers The mucopolysaccharide content is increased greatly in the affected skin and, to a less extent, in the patient s unaffected skin Pretibial myxedema was present before hyperthyroidism was treated in 9 patients it developed after treatment in 13 others The usual order of onset of symptoms is hyperthyroidism, exophthalmos, pretibial myxedema, and in some patients acropachy The cause of pretibial myxedema is obscure Mild lesions tend to resolve or to get no worse when hyperthyroidism is cured The prognosis in severe pretibial myxedema appears to be unaffected by treatment

Hemopentoneum in von Willebrand s Disease —The term von Willebrand s disease describes an ill-defined hemorrhagic diathesis in which spontaneous bleeding takes place from mucosal surfaces It also has been designated hereditary pseudohemophilia Unlike patients with classical hemophilia, those with von Willebrand's disease *can sometimes undergo* surgery without severe secondary bleeding This paper describes an unusual complication of von Willebrand's disease, namely, rupture of ovarian follicular cysts A 16-year-old girl was hospitalized because of severe lower abdominal pain She had always bruised easily, had frequent nose bleeds, and heavy menstrual periods, she had bled severely after tonsillectomy Investigation revealed a prolonged bleeding-time but normal platelet count The girl's mother and twin sister had a similar hemorrhagic tendency Bleeding into the peritoneal cavity was suspected, and abdominal exploration revealed an extensive hemoperitoneum due to a bleeding ruptured follicular cyst, this was oversewn with catgut During and after the operation blood transfusions were given Six months later she again received blood transfusions because of severe anemia resulting from menorrhagia At a 3rd admission 9 months later (July 1958), although the platelet count was low, it was not as low as on the 2 previous admissions On January 9, 1959, she again had a serious intra-abdominal hemorrhage Oophorectomy was performed Microscopic examination showed several recent hemorrhages into the stroma and rupture of a follicle This patient has inherited a hemorrhagic tendency from her mother, which can be classified as von Willebrand's disease

Cancer, Philadelphia

13 652-864 (July-Aug) 1960 Partial Index

Tumors of Minor Salivary Glands
G Fine, R B Marshall, and R C Horn p 653
*Mammary Cancer Treated Only with X-Rays
A Hochman and E Robinson p 670
Intrathecal Amethopterin in Cancer
Y A El-Ghaffar p 677
Kaposi s Sarcoma in Infants and Children
W Dutz and A P Stout p 684
*Hemangiopericytoma in Children
S L Kauffman and A P Stout p 695
Radiation Therapy in Primary Liver Cancer
R Phillips and K Murakami p 714

Mammary Cancer Treated Only with X-Rays —The authors report on 82 women, 20 to 80 years of age, with cancer of the breast who received roentgen irradiation therapy only, at the Rothschild Hadassah University Hospital, Jerusalem, Israel, between 1932 and 1952 Of these, 16 with carcinoma in STAGES 1, 2, and 2-3 were considered to be operable, 35 had carcinoma in STAGE 3, and 31 had carcinoma in STAGE 4 The 5-year and 10-year survival rates of the patients treated for carcinoma in STAGES 1 and 2 were relatively high However, all except one of the patients who lived longer than 10 years had signs of local recurrence or of metastatic spread, often with severe late radiation damage of the irradiated breast It seems, therefore, that patients with carcinoma in STAGE 1 and early STAGE 2 fare better with surgical treatment Patients in the later stages appear to fare better with irradiation therapy

Hemangiopericytoma in Children —From the Laboratory of Surgical Pathology of Columbia University College of Physicians and Surgeons and the Laboratory of Pathology, Francis Delafield Hospital, New York, the authors report on 12 girls and 19 boys, ranging from newborn to 15 years of age, with hemangiopericytoma Of the 31 children, 20 had benign, 5 had questionably malignant, and 6 had malignant hemangiopericytoma The sites of the tumors varied, 11 tumors were found in the head and neck, 10 in the lower extremities, 6 in the upper extremities, and 4 in the chest There were single instances of hemangiopericytoma in the retroperitoneal tissues and abdominal wall Thirteen of the tumors were congenital Histopathologically, most of the tumors had reticulin fibers surrounding the pericytes, but some lacked this feature entirely Most of the malignant tumors were more deeply placed, generally in the muscle There was no reliable correlation between rate and duration of growth and metastasis When one attempts to compare the hemangiopericytoma in children with the same tumor in adults, the comparison is handicapped because no extensive study has been made of its biological behavior in adults It has been noted that the deep thigh, leg, and retroperitoneum are among the favored sites for the development of malignant tumors in adults The same is probably true in children Of the 5 children with thigh tumors, 2 had definitely malignant tumors and 1 had a questionably malignant tumor One of the 2 leg tumors was malignant, and the only retroperitoneal tumor in a child was malignant Complete radical surgical excision appears to be the preferred form of treatment The few cases in which radiotherapy was tried did not suggest that this tumor form is radiosensitive

Canadian Medical Association Journal, Toronto

83 189-242 (July 30) 1960 Partial Index

*Mitral Valve Surgery
P Allen and R Robertson p 189
Pulmonary Function Tests
D V Bates and others p 192

Mitral Valve Surgery —*Open heart operation was performed in 24 patients with disease of the mitral valve of rheumatic origin* There were 18 women and 6 men, ranging in age from 16 to 55 years The patients were followed up for periods of from 5 to 24 months Six of the patients had pure mitral regurgitation, 1 had mitral regurgitation associated with aortic regurgitation, 13 had mitral stenosis and regurgitation, 1 had mitral stenosis and mitral regurgitation associated with aortic regurgitation, and 3 had mitral stenosis alone All the patients with combined stenosis and regurgitation were subjected to a left atrial puncture, performed by the transbronchial route In the 6 patients with pure mitral regurgitation there was no demonstrable valvular calcification In 5 of the 13 patients who had combined lesions of the mitral valve, there was fusion and calcification of the anterior commissure, while posteriorly there was an absolute loss of the leaflet tissue Four patients had anterior and posterior calcified fusion bridge producing mitral stenosis, while regurgitation occurred through the fixed mitral orifice secondary to almost complete immobility of the fibrosed leaflets There were 4 postoperative deaths (1 week) arising from errors in surgical or combined surgical and perfusion techniques The 5 late deaths were due to reactivation of acute rheumatic carditis The initial improvement in the 15 surviving patients has been sustained at a level of functional STAGE I and II

Hospital, Rio de Janeiro

58 1-212 (July) 1960 Partial Index

Aortic Aneurysm Dacron Graft Under Extracorporeal Circulation—D J Moraes and others p 1
Cardiovascular Effects of Guanethidine Sulfate
L Sollero and R S Moura p 11

*Colistin Sulfate in Genitourinary
  Infections—A Sadi and others p 83
Tumor Like Lesions in Cryptococcosis of Brain and other
  Organs—M E A Pasqualucci p 139

Colistin Sulfate in Genitourinary Infections —Eleven patients whose ages ranged from 5 months to 78 years were treated with the new antibiotic colistin for genitourinary infections caused by different agents Colistin is a product of fermentation isolated from *Bacillus polymyxa* by the Japanese Yasuo and co-workers in 1946 It was administered to the 11 patients in the dosage of 1 million units every 12 or 24 hours for adults and in half this dosage for children The maximal total dose given was 10 million units The patients in this series had previously been treated unsuccessfully with other types of antibiotic Six of them were completely free from symptoms, with negative urine culture, on completion of the colistin treatment 2 improved both in relation to the symptoms and to the general condition, 1 improved only temporarily, and 2 still had symptoms of infection One patient experienced mild dizziness during the treatment It is concluded that colistin sulfate is a more effective antibiotic for treating urinary infections, especially those caused by *B coli* It is free from toxic effects and can be given to children

J Clin Endocr, Springfield, Ill

20 1051-1206 (Aug) 1960 Partial Index

*Persistent Thyroid Function Following Hypophysectomy
  A G Pazianos and others p 1051
Studies on the Biologic Characterization of Human
  Gonadotropins—A Albert and I Derner p 1059
Adrenocortical Steroid Metabolism in Newborn Infants
  R A Ulstrom and others p 1066
Prolactin Activity in Human Blood
  B Simkin and D Goodart p 1107
Metabolic and Renotropic Effects of Human Growth
  Hormone in Disease—H Gershberg p 1107
*Prominent Peripheral Edema Associated with Primary
  Aldosteronism—R S Goldsmith and others p 1168
*Seminiferous Tubule Dysgenesis Associated with Familial
  Cerebellar Ataxia—A Hecht and H Ruskin p 1184

Persistent Thyroid Function Following Hypophysectomy —Thyroid function tests were given to 10 patients selected from a series of 350 who had undergone hypophysectomy for mammary carcinoma Four of the patients had obtained remission of the mammary cancer, while 6 had failed to respond All patients were considered euthyroid prior to hypophysectomy and none received thyroid replacement after the operation Serum protein-bound iodine (PBI) was measured in duplicate and thyroidal I^{131} uptake was determined 24-hours after the oral administration of 10 to 50 μc of I^{131} Triiodothyronine (T_3) suppression tests were performed in 7 patients Thyroidal I^{131} uptakes and/or serum PBI determinations were obtained before and at the end of a 7 day period Thyroid-stimulating hormone (TSH) was given intramuscularly to 4 patients The results showed normal serum PBI levels and thyroid radioiodine uptakes up to 2½ years after the hypophysectomy T suppression tests showed that the thyroid function was not significantly inhibited in the 8 patients in whom the tests were performed Autopsy findings on 5 of the 7 patients who died revealed adenomas in 3 and a normal thyroid gland in 2 The persistence of thyroid function after hypophysectomy in these 10 patients suggests that under certain circumstances the thyroid may function in the absence of TSH and that autonomous function is not necessarily associated with recognizable alteration in the microscopic appearance of the thyroid epithelium

Peripheral Edema Associated with Primary Aldosteronism —A 39 year-old woman was hospitalized with a diagnosis of essential hypertension with no evidence of myocardial insufficiency Her first symptom 5 years prior to hospitalization had been edema of the face and hands in the morning, disappearing within a few hours As the edema became more marked and extensive, the patient developed headache, weakness, occasional dizziness, albuminuria, and hypertension The results of multiple adrenal and renal studies led to the diagnosis of primary aldosteronism A left adrenal tumor was visualized radiographically and bilateral adrenal exploration was performed A well-encapsulated tumor, found within the left adrenal, was removed with the entire gland Biopsies of the kidney and the right adrenal showed normal histologic structure The edema disappeared, blood pressure returned to normal and the electrocardiogram showed an increase in the T vector The patient experienced a transient inability to retain sodium, which led to marked sodium loss and hyponatremia when a low-sodium diet was instituted The edema reappeared when desoxycorticosterone was administered but again disappeared when it was stopped It was concluded that in a clinically normal subject extensive edema may develop (1) as a result of excessive sodium-retaining steroid, and (2) as a result of an aldosteroma This raises the question of whether in other patients with these 2 findings the degree of hypokalemic alkalosis will tend to be inversely related to that of the edema

Seminiferous Tubule Dysgenesis Associated with Familial Cerebellar Ataxia —A 31-year-old man was hospitalized because of ataxia which affected his whole body, but predominantly the head and upper limbs Physical examination showed the patient to be eunuchoid and to have poorly developed secondary sex characteristics, small testes, azoospermia, and dysgenetic seminiferous tubules The nuclear chromatin pattern was female which indicated the congenital nature of the testicular condition As seminiferous tubule dysgenesis is known to occur in association with several abnormalities of the central nervous system, including dystrophia myotonica and mental deficiency, male members of the patient s family were examined None was found to have a female nuclear chromatin pattern nor any clinical evidence of Klinefelter s syndrome The patient s father, 1 brother, and 1 sister suffered from the same type of ataxia, 1 niece was in a mental hospital because of mental retardation and epilepsy The authors believe that this is the first reported case of chromatin-positive Klinefelter s syndrome associated with familial cerebellar ataxia and that this association may be purely coincidental, since the estimated incidence of Klinefelter s syndrome is 1 in every 100 men

J Int Coll Surg, Chicago

34 143-280 (Aug) 1960 Partial Index

*Removal of Celiac Axis in Gastrectomy for Carcinoma
  L H Appleby .. p 143
*Actinomycosis Borderline Cases
  J Hertz p 148
Chronic Arterial Insufficiency of Lower Extremities
  W H Moretz p 169
Ischiorectal Prostatic Adenomectomy
  E Ortega .. p 179
Suprapubic One-Stage Prostatectomy
  G H Ewell p 188
Vaginal Hysterectomy After Previous Pelvic Operations
  W M Jacobs and others p 196

Removal of Celiac Axis in Gastrectomy for Carcinoma—The author reports on 91 patients with carcinoma of the stomach who underwent gastric resection in Vancouver, British Columbia, between 1953 and 1958 In 19 of these patients, the gastrectomy involved block resection of the celiac axis, while the remaining 72 patients had ordinary gastric resection A previous report by the author on the removal of the celiac axis *en bloc* with the stomach included 13 patients operated on between 1948 and 1953 Three operative deaths occurred among the 72 patients—an operative mortality of 4% One operative death occurred among the 19 patients and none among the 13 patients undergoing celiac resection, total operative mortality among the 32 patients was 3 1% Plainly, resection of the celiac axis does not add to the mortality attendant on lesser procedures Of the 32 patients, 14 (43%) were alive when this report was submitted for publication, including the first patient, who has survived more than 10 years Of these 14 survivors, 12 are considered free of carcinoma, and 2 apparently have recurrences Of the 18 who died, the average survival was 4 years and 2 months, and 8 of these died of other causes than carcinoma Of the 72 patients undergoing ordinary resections, only 18 (25%) are alive today Among the 54 who died the average period of survival was 17 months Since the author's experience indicates that only about 12% of all patients with gastric carcinomas are at present permanently curable, he considers total removal of the celiac axis artery, with its attendant nodes, a definite contribution to the surgical treatment of carcinoma, bringing the actual physical procedure into line with other standard extirpative procedures for this purpose

Actinomycosis Borderline Cases—The author reports on 6 men and 5 women, 19 to 72 years of age, with borderline actinomycosis, who were seen in the department of special surgery of the Royal School of Dentistry in Stockholm, Sweden The mycological examinations were performed in the State Serum Institute in Copenhagen, Denmark The term "borderline" has been used to indicate that the diagnosis of actinomycosis could be established only by bacteriological examination, including cultivation, whereas the clinical course presented particular and peculiar features Of the 11 patients, 5 had typical and 6 had atypical forms of actinomycosis In 3 of the 6 patients with the atypical forms of the disease there was a tumor-like soft swelling in the cheek, and, in 1 patient, a large cystic process in the lower jaw In 2 patients, the clinical picture corresponded to the entity previously described by the author, with the development of a firm, tumor-like mass solidly attached to the bone The root canals of the teeth of the patients have been discussed as a possible portal of entry for the infection In some patients cure was brought about by treatment with large doses of penicillin and in others by a radical surgical procedure supported by the administration of penicillin in large doses

Journal of Laryngology & Otology, London

74 437-510 (July) 1960 Partial Index

Traumatic Perforations of the Lower Esophagus
R W Bailie and others p 437
Colloid Chemistry of the Common Cold
J G Ladányi p 447
Critical Review of Tympanoplastic Surgery
I B Thorburn p 453
*Water and Salt Balance in Ménière's Disease
P H Golding-Wood p 480

Water and Salt Balance in Ménière's Disease—Disturbances of water and salt balance have been held to be important in a number of diseases such as epilepsy, migraine, bronchial asthma, allergic conditions, hypertension, and Ménière's disease The endolymphatic hydrops characteristic of Ménière's disease has been attributed to an extracellular edema related to retention of fluid and sodium ions In the clinical management of this condition, restriction of fluid and salt intake has been widely advocated After critically reviewing the evidence on which the fluid and salt restriction has been based, the author describes his own clinical investigations on the influence of over-hydration, salt restriction and excess salt intake in patients with Ménière's disease He concludes that fluid and salt restriction is probably a valueless and unjustified measure *in the management of Ménière's disease* Disturbance in fluid and salt balance appears to have no bearing on the etiology of this condition

Journal of Neurosurgery, Chicago

17 573-800 (July) 1960 Partial Index

Effect of Cortisone on Cerebral Edema
R G Lippert and others p 583
Hematomas in Patients with Hydrocephalus
J R Youmans and R C Schneider p 590
*Glioblastoma Multiforme
J G Roth and A R Elvidge p 736
*Results of Treatment of Ruptured Aneurysms
W McKissock, K W E Paine and L S Walsh p 762

Glioblastoma Multiforme—The authors report on 495 patients with glioblastoma multiforme who were treated at the Montreal Neurological Institute, Montreal Of these 5 were treated conservatively, 73 had only needle biopsy, 13 had only biopsy at operation, and 404 were operated on and removal of the tumor was attempted Males predominated in a ratio of 3 to 1 Glioblastoma multiforme tended to occur with equal frequency in either hemisphere and grew at widely varying rates in different patients In general, multiple-lobe tumors occurred in patients older than those with single-lobe involvement, and patients with involvement of basal ganglions and thalamus were younger than those with single lobe involvement Patients with lesions of the brain stem and pons made up the youngest group, while spinal-cord involvement appeared at all ages The prognosis appeared to be more favorable for patients aged less than 35 years and for females Patients with a focal or a generalized seizure as the first symptom tended to have a longer interval between the first symptom and hospitalization than the average They also appeared to have a somewhat better postoperative prognosis Patients with motor weakness, confusion, stupor, or coma had a poorer postoperative prognosis than average The prognosis was considerably better for patients operated on than for those who had biopsy only or were not operated on Patients with an apparently complete removal showed a longer average survival than those with a known incomplete removal This however, is not nearly so significant as the consistently better average survivals with roentgen-ray therapy

Results of Treatment of Ruptured Aneurysms—The authors report on 599 patients with angiographically verified ruptured intracranial aneurysms The anterior cerebral-anterior communicating arteries were the site of the aneurysms in 174 patients, the internal carotid-posterior communicating arteries in 165, the middle cerebral artery in 101, the bifur cation of the internal carotid artery in 51, the peripheral anterior cerebral artery in 15 the posterior cerebral and vertebral system in 19, and 14 had multiple aneurysms Of the 599 patients, 429 were treated surgically and 170 were given conservative treatment An analysis with respect to the various factors related to the mortality showed that although surgical treatment appeared to benefit these patients when only gross mortality figures were considered, this was because of selection of the better patients for surgical treatment, and it has been demonstrated that if more nearly similar groups can be obtained the mortality of conservatively treated patients approximates the surgical mortality In the group of patients who are moribund or whose condition is rapidly deteriorating the angiographic demonstration of a large intracerebral hematoma is an indication for immediate surgical intervention to evacuate the clot and, if possible, to deal with the aneurysm radically If however, no intracranial hematoma is present the patients chances of recovery are as good with or without surgery This conclusion is based on a retrospective analysis which remains to be confirmed or refuted by analysis of a properly planned trial of surgical and conservative measures Such a trial is now in progress with the proviso that patients who harbour a large intracerebral hematoma are excluded from the trial and operated on immediately

Journal of Pediatrics, St Louis

57 151 316 (Aug) 1960 Partial Index

Chemical Factors in Respiration of Newborn H S Reardon and others	p 151
Electrocardiogram in Pulmonary Stenosis M A. Engle and others	p 171
The I^{131} Uptake in Children M Diwany and others	p 180
Splenectomy and Infection R. V Lucas and W Krivit	p 185
Corticosteroid Therapy and Growth D S Fleischer and others	p 192
*Pheochromocytoma with Pyelonephritis O K Harlem	p 225

Pheochromocytoma with Pyelonephritis —A 9-year-old girl is reported in whom diagnosis of a pheochromocytoma was made before operation The patient also had secondary hydronephrosis and pyelonephritis on the left side The operation showed that both adrenals appeared normal Near the end of the left common iliac artery and vein, where they were crossed by the corresponding ureter, a walnut-sized tumor was found The upper part of the left ureter and the kidney were removed together with the left common iliac artery The pathological diagnosis of the tumor was a pheochromocytoma (paraganglioma) which was responsible for the hydro-urether hydronephrosis, and subacute pyelonephritis The postoperative course was uneventful The blood pressure and the urinary output of catecholamines returned to normal More than 1 year after the operation the patient had no symptoms or signs of pheochromocytoma It is of interest that allergy, which did not cause any discomfort to the patient before the operation, became troublesome after the tumor had been removed and the concentration of catecholamines had returned to normal This tumor is uncommon in children but it should be considered in those with persistent or intermittent hypertension Cone and coworkers found 34 cases of pheochromocytoma in children reported in the literature prior to 1956 Of the 46 tumors described, only 8 were outside the adrenals The aortic bifurcation was the 2nd most frequent site

Lancet, London

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Arterial Auscultation W S Peart and C Rob	p 219
Postoperative Prophylactic Anticoagulants D G Chalmers and others	p 220
*Vasopressin in Bleeding from Esophageal Varices S Shaldon and S Sherlock	p 222
*Cerebellar Syndrome in Myxedema F H Jellinek and R E Kelly	p 225
*Large Dose of Antitoxin in Clinical Tetanus A Brown and others	p 227
Wound Healing and Rate of Histamine Formation G Kahlson and others	p 230
Acute Adrenal Insufficiency After Steroid Therapy A E Stevens	p 234
Durability of Suture Materials B N Catchpole	p 236
Endocarditis Complicated by Agranulocytosis P Wood and R Parker	p 242

Vasopressin in Bleeding from Esophageal Varices —The authors report on 4 men and 4 women, 34 to 73 years of age, with bleeding from esophageal varices associated with cirrhosis and portal hypertension, who were treated with vasopressin (Pitressin) at the Royal Free Hospital, London Twenty units of vasopressin were diluted in 100 cc of 5% dextrose and were given intravenously over a 10-minute period The stomach was aspirated every 30 minutes through a Ryle's tube Control of hemorrhage was estimated by disappearance of blood from the gastric juice and by serial pulse and blood-pressure recordings After the administration of vasopressin gastric aspiration became clear of blood within 1 hour and pulse and blood pressure were maintained without further transfusion in all patients Estimated portal pressures fell In 3 patients bleeding did not recur, and in 2 of these portacaval anastomosis was later performed Hemorrhage recurred in 5 patients and a diminished response to vasopressin was observed Four patients died with a terminal massive hemorrhage This high mortality reflected the degree of liver failure rather than the method of treatment. No adverse side-effects were observed with vasopressin and its use as an alternative to the Sengstaken esophageal compression tube is suggested

Cerebellar Syndrome in Myxedema —The authors report on 5 women, 52 to 75 years of age and a 62-year-old man with myxedema who were admitted to the Maida Vale Hospital London and in whom moderate to severe cerebellar syndromes were observed Five of the 6 patients were treated with thyroid in doses ranging from 1½ Gm to 4 Gm daily, and there was remission of the cerebellar signs within 2 to 8 weeks after the start of thyroid therapy One patient was left with an appreciable cerebellar disorder suggesting metabolic or vascular processes which may lead to degeneration Hypothyroidism should be considered, but it should be excluded in patients with obscure cerebellar aspects The myxedema may not be at all obvious, and the neurological syndrome is treatable

Large Dose of Antitoxin in Clinical Tetanus —The beneficial effect of antitoxin in clinical tetanus has not previously been established and there are hospitals in India and Africa in which tetanus antitoxin is not used, both because the worth of the drug is considered unproved and because money for supplies is not available To test the value of a large dose of antitoxin in reducing mortality among patients with tetanus, the authors carried out a clinical trial in 79 patients with tetanus Of these, 67 were treated at the University College Hospital, Ibadan Nigeria, and 12 were treated at the University College Hospital of the West Indies, Jamaica The analysis of the results was done in London Forty-one patients whose average age was 24 8 years, were given 200,000 I U of tetanus antitoxin, and 38 patients whose average age was 27 1 years, were not given tetanus antitoxin Twenty (49%) of the 41 patients receiving 200,000 I U of antitoxin died, as compared to 29 (76%) of the 38 patients not receiving antitoxin The probability of this result arising by chance is less than 1 in 20 After correction for a chance allocation which favored the group receiving antitoxin, there was still a substantially lower mortality among patients in this group Tetanus antitoxin is a valuable remedy in clinical tetanus

Metabolism, New York

9 611-698 (July) 1960 Partial Index

*Hypertension Caused by Renal Artery Occlusion Simulating Aldosteronism—J C Laidlaw and others p 612

*Aldosteronism and Malignant Hypertension Corticosteroid Studies—J Genest and others p 624

Gastrointestinal Absorption and Excretion of Mg^{28} in Man L A Graham, J J Caesar and A S V Burgen p 646

Carbutamide in 'Depancreatized Dog with Ectopic Pancreas—A Sirek, O V Sirek, and Y Hanus p 660

Observations on Carbohydrate Metabolism in Obesity W I Morse and others p 666

Renal Excretion of Calcium in Man D H Copp, G D McPherson, and H W McIntosh p 680

Incorporation of Acetate Into Cholesterol by Rat Liver Slices—W F Perry p 686

Hypertension After Renal Artery Occlusion Simulating Aldosteronism —The authors present 2 men with unilateral renal artery occlusion, in whom the clinical and laboratory picture was similar to that of primary aldosteronism (Conn's syndrome) A 55-year-old man had malignant hypertension with hypokalemic alkalosis, polyuria, alkaline urine of low specific gravity, and increased aldosterone excretion He died 2 days after total adrenalectomy for bilateral adrenal hyperplasia Autopsy revealed that a thrombus occluded the left renal artery There was atrophy and infarction of the left kidney The chief change in the right kidney was foamy swelling of the epithelium of the convoluted tubules similar to that seen in the nephropathy of potassium depletion, other changes were related to hypertension In the 2nd patient, a 33-year-old man, who also had malignant hypertension, the clinical picture was suggestive of Conn's syndrome excessive thirst, polyuria, and inability to concentrate urine, associated with serum calcium levels slightly below the normal range The artery to the lower pole of the right kidney was found to be occluded by infarction and atrophy The nonischemic portion of the kidney showed potassium depletion and nephropathy After nephrectomy all features of Conn's syndrome disappeared and the blood pressure became normal It is suggested that the unilateral renal disease in these patients caused both hypertension and increased aldosterone secretion, and that the latter caused the potassium depletion Urinary aldosterone levels were determined in 5 other patients with renal artery insufficiency, none of these showed signs of potassium depletion, but in 2 of them aldosterone excretion was increased before operation It is pointed out that a clinical condition very similar to primary aldosteronism may occur in unilateral renal disease

Aldosteronism, Malignant Hypertension, and Corticosteroids —A 15-year-old girl with severe malignant hypertension, attacks of tetany, periodic muscular weakness, absence of edema, and signs of pyelonephritis had abnormally high levels of urinary adlosterone, hypokalemia, and a negative potassium balance, this is typical for the syndrome of primary aldosteronism reported by Conn At operation, both adrenals appeared normal but on histological examination they showed an increase in width of the zona glomerulosa Renal hemodynamics and urinary excretion of electrolytes, cortisone, and hydrocortisone, and their derivatives were repeatedly determined Corticosteroids in the excised adrenal tissue were extracted and analyzed Prior to adrenalectomy, reserpine caused a fall in blood pressure with orthostatic hypotension and a positive sodium and potassium balance Chlorothiazide produced a marked saluresis despite greatly increased aldosterone secretion An intravenous corticotropin test demonstrated responsiveness of aldosterone secretion, whereas human growth hormone on short term administration produced little change, and spirolactone increased sodium excretion without greatly affecting excretion of corticosteroids The excised adrenal tissue contained large amounts of cortisone and hydrocortisone, and on incubation, in comparison with tissue from a patient with Cushing's syndrome, produced twice as much aldosterone but only one-quarter the amount of hydrocortisone and one-half as much corticosterone Postoperatively, vascular hyper-reactivity and hypertension persisted, and her blood pressure was very sensitive to the level of sodium intake and the dosage of 9 alpha-fluorohydrocortisone or d,l-aldosterone acetate In the last several months she has been well and free from symptoms

Monatsschrift fur Kinderheilkunde, Berlin

108 337-372 (July) 1960 Partial Index

*Pulmonary Cirrhosis (Hamman-Rich Syndrome) in Children—V Becker and J Schmidt p 337

Electrophoretic Studies on Blood Proteins During Childhood—G Korver p 346

Prothrombin Complex and Inhibitors of Coagulation in Menarchal Menorrhagia—H Bruster p 352

Esophagocardial Syndrome with Pylorospasm and Cascade Stomach—R Rohr p 354

Pulmonary Cirrhosis —*The authors present a case of diffuse interstitial pulmonary fibrosis (Hamman-Rich syndrome)* which had 2 unusual aspects (1) The disorder occurred in a child, although such patients are usually between 40 and 50 years of age (2) The elastic fibers of the pulmonary supporting tissue were chiefly involved (elasticodieretic form) The child had a cough, then dyspnea, weakness, loss of weight, and clubbed fingers developed Roentgenoscopy revealed small spots disseminated over both lungs and swelling and greater density in the hilus region The respiratory impairment increased despite various therapeutic efforts, the child died at the age of 11 years Symptoms had existed for about 2¼ years and had been variously diagnosed as bronchitis, miliary bronchopneumonia, tuberculosis of the hilar lymph nodes, miliary tuberculosis, mediastinal exsudation, carditis, mitral stenosis with pulmonary stenosis, and sarcoid of Boeck The symptoms of pulmonary cirrhosis were fully developed during the last 2 months of life, an extensive pulmonary lesion had greatly impaired the respiratory function and had resulted in cor pulmonale Death was due to asphyxia Autopsy revealed chronic indurating interstitial pneumonia The pulmonary cirrhotic process was characterized by destruction of the elastic fibers (elasticodieresis), the stages of degeneration were evident in the pulmonary supporting tissues together with crystalline inclusions of the type of Schaumann bodies In comparing this case with others in which the Hamman-Rich syndrome occurred during childhood it was found that, depending on the type of tissue that is chiefly involved, the Hamman Rich syndrome can be subdivided into a muscular, a fibrous and an elasticodieretic form of pulmonary cirrhosis

New England Journal of Medicine, Boston

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Open Heart Surgery W B Neptune J A Bougas and F G Panico	p 111
Release of Riboflavin A B Morrison C B Perusse and J A Campbell	p 115
Massive Thoracic Extramedullary Hemopoiesis R B Hanford and others	p 120

Streptococcal Infections —The authors studied the incidence and complications of streptococcic infections in 204 adolescents and 94 adults who had been free of rheumatic fever for at least 5 years preceding this study, which was carried out in 2 outpatient clinics, the La Rabida Jackson Park Sanitarium Home Service and the Northwestern University Medical Clinics Chicago The 298 patients were followed for 572 patient-years Antistreptococcic prophylaxis was modified so that only clinically apparent, symptomatic streptococcic infection was treated with appropriate antibiotics Asymptomatic infections were detected by throat cultures and determinations of streptococcic serum antibodies which were made routinely every 2 months and whenever respiratory disease was present Rates of streptococcic infection were as follows in adolescents 11 to 22 years of age, 23 2% per patient-year, and in adults 23 to 70 years of age, 12 8% per patient-year There were 7 recurrences in adolescents and none in adults The rheumatic recurrence rates in adolescents were 1 8% per patient-year, and 9% per subclinical streptococcic infection In concommitant studies, children receiving prophylactic treatment had rheumatic recurrence rates of 2 4% per patient-year and 17 5% per subclinical infection There was therefore a downward trend with age in the incidence of streptococcic infections and in the frequency with which these infections reactivated rheumatic fever

New Zealand Medical Journal, Wellington

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*Cryptococcosis and Associated Hodgkin s Disease F Smith	p 285
Ward Cleaning Equipment and Aerial Contamination H T Knights	p 291
Dissecting Aneurysm of the Aorta in a Child L G Hannah	p 296

Cryptococcosis and Hodgkin's Disease —Two cases of Hodgkin s disease and associated disseminated cryptococcosis in men aged 61 and 40 are reported and the postmortem and histological findings recorded In both cases the diagnosis of Hodgkin s disease was established during life by lymph node biopsy In the 2nd of these patients this disease had been present 12 years In the 1st patient the diagnosis of cryptococcosis was dependent on histological examination of the postmortem material In the 2nd patient *Cryptococcus neoformans* was found in the cerebrospinal fluid 2 weeks before death Postmortem material showed enormous numbers of cryptococci in every organ examined In neither case did the lymph nodes removed during life reveal any cryptococci Cryptococci are not readily seen in sections stained by hematoxylin and eosin, and recourse should be made to stains like mucicarmine, toluidine blue, or periodic-acid-Schiff which stain the gelatinous capsule The author feels that a sufficient number of cases of coexistent malignant disease and cryptococcosis have been described for the occurrence to be merely fortuitous Antibiotic therapy, alone or combined with steroids, may have some adverse effect on the course of cryptococcosis The 1st patient received small doses of antibiotics for recurrent pneumonia over a period of 2 years before death The 2nd patient received a short course of chloramphenicol (Chloromycetin) a year before death For hemolytic anemia he was treated with cortisone and later with prednisone for several months up to death

Obstetrics and Gynecology, New York

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*Prognostic Factors in Radioresistant Cervical Cancer B C Burns Jr and C B Brack	p 1
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Cesarean Section on the Dead and Moribund I G Cloud	p 27
Teen Age Pregnancies J P Semmens and J C McGlamory	p 31
*Contralateral Corpus Luteum and Ectopic Pregnancy M Berlind	p 51
*Arrhenoblastoma of the Ovary P Pedowitz and F B O Brien	p 62

Radioresistant Cervical Cancer —The authors studied 151 women with carcinoma of the cervix who were treated with radiation at the Johns Hopkins Hospital, Baltimore between 1950 and 1953, in an attempt to evaluate survival in those patients suspected of recurrent disease Of 77 patients without clinical evidence of recurrent carcinoma, 53 (68 8%) lived 5 or more years after completion of therapy Only 9 (12%) of the 74 patients clinically suspected of recurrence are presently living and well The possibility of recurrence was questioned in 74 (48 5%) of the 151 patients at some time during their follow-up, but positive proof of recurrence was obtained by cervical biopsy in only 23 2% Where recurrence of cancer was clinically suspected, pathological proof was obtained in 47 3% Of the 39 patients in whom recurrent disease was never actually proved while alive 48% were dead within 1 year of the date of suspected recurrence Twenty (57 1%) of 35 patients, in whom recurrence was proved, were dead within 1 year of the date of suspected recurrence If more than 2 months elapsed between suspicion and proof of recurrence, 81% of the patients were dead within 1 year The authors believe that if at any time after 2 months after irradiation therapy there is reasonable clinical suspicion of recurrent or persistent disease, surgical intervention must be prompt At the time of initial suspicion of recurrence 66% of the 74 patients in both proved and unproved groups were considered clinically operable Six months after clinical suspicion of recurrence 17% of the patients with proved recurrence and 28% of those with unproved recurrence were considered inoperable by pelvic examination The importance of early diagnosis and immediate surgical treatment of radioresistant carcinoma of the cervix cannot be stressed too strongly

Contralateral Corpus Luteum and Ectopic Pregnancy—In a series of 48 women with ectopic pregnancies studied at the Unity Hospital, Brooklyn, N Y, between 1955 and 1959, it was found that the corpus luteum was situated on the side opposite to the pregnant tube in 24 women (50%), and on the same side as the ectopic pregnancy in the remaining 24 women Thus in exactly one-half of the women with ectopic pregnancy, the corpus luteum was found on the contralateral side Of 18 women with intrauterine pregnancy and with congenital or surgical absence of a tube or an ovary, in whom an intraperitoneal condition required laparotomy, a diagnosis of the position of the corpus luteum was accurately made in 12 In only 1 of the 12 was the corpus luteum on the side on which the tube was absent In other words, there was only 1 case (8 3%) of transmigration of the ovum among these 12 intrauterine pregnancies, in contrast to the 50% incidence of transmigration of the ovum among the 48 ectopic pregnancies It appears that transmigration of the fertilized ovum, with its consequent enlargement and inability to pass through the tube, may be an important factor in ectopic pregnancies The frequency of this transmigration is exemplified by the contralateral corpus luteum in 50% of all tubal gestations

Arrhenoblastoma of the Ovary—The authors report on 2 Negro women, aged 27 and 44 years, with arrhenoblastoma of the ovary, the diagnosis of which was made at the Kings County Hospital, Brooklyn, N Y Two hundred thirty-eight such cases were collected from the literature The study of these 240 cases revealed that the striking changes produced by the endocrine activity of the neoplasm overshadow the symptoms common to most ovarian neoplasms The degree of virilization of the patient is dependent on the androgenicity of the tumor and the sensitivity of the end organs Some tumors are biologically inert Of the 238 cases collected from the literature, the tumors were of type 1 in 48, and most of these were virilizing, it is possible that many of the tumors contained large numbers of Leydig cells between the tubules, and that these cells were responsible for the predominant picture of masculinization Of the 240 cases, 51 (21 3%) were proved to be malignant, however, the true incidence of malignancy is probably in the neighborhood of 25 to 30% In the absence of metastases, only the subsequent clinical course will determine whether the arrhenoblastoma is benign or malignant At present, total 17-ketosteroid excretion levels are not as important for the diagnosis as determination of the various fractions This fractionation will enable one to incriminate the ovary as the cause of virilization A technique permitting earlier diagnosis of arrhenoblastoma is outlined

Revista Hospital das Clínicas, São Paulo

15 159-216 (May-June) 1960 Partial Index

*Kidney Biopsy Anatomicoclinical Correlation of Findings—I Nussenzveig and others p 159
Diagnostic Problems in Acute Abdomen During Acute Renal Failure—I Nussenzveig and others p 196
Kidney Function During Recovery from Acute Renal Failure—R V Saldanha and others p 201
Serum Mucoprotein Levels in Acute Renal Failure H Elkis and others p 207

Kidney Biopsy Anatomicoclinical Correlation of Findings—One hundred eleven renal biopsies were performed in 95 patients according to a new technique developed by the authors and described as an open-sky puncture biopsy This operation is performed under general anesthesia after an excretory urography has determined the position of the kidneys A 2-centimeter incision is made along the lower border of the 12th rib, following the position of the kidneys The aponeurosis of the transversalis muscle is incised, the kidney is located by digital exploration, and the material is aspirated with a needle of the Iversen-Roholm type Punctures are made in the upper and lower renal poles and in the central portion in order to have representative samples of the organ There were no postoperative accidents among the 95 patients reported Three biopsies indicated normal renal structure and served as controls, the findings suggested a nephrotic syndrome in 44 patients, chronic glomerulonephritis in 13, arterial hypertension in 13, acute renal insufficiency in 11, chronic pyelonephritis in 6, diffuse acute glomerulonephritis in 2, and other renal diseases in 2 In every case the renal tissue obtained by this technique was adequate for establishing the diagnosis, prognosis, and therapeutic orientation Several cases are described to illustrate the application of the information provided by the open-sky puncture-biopsy Autopsy findings in 8 patients confirmed the biopsy data

Semaine des hôpitaux, Paris

36 1903-1960 (June-July) 1960 Partial Index

*Subdural Hematomas During Hypernatremic Dehydration in Infants—R Turpin and others p 1903
Grave Jaundice in Epileptic Patient Treated with Phenylacetylurea—R Turpin and others p 1915
Neurofibromatous Facial Hemihypertrophy with Buphthalmos—R Turpin and others p 1921
Comparative Study of Early and Delayed Measles Encephalitis—P Giraud and others p 1926
Total Abnormality of Pulmonary Venous Return into Persistent Left Superior Vena Cava—J Chaptal and others p 1940

Subdural Hematomas in Hypernatremic Dehydration in Infants—Two infants, aged 2 and 3 months, respectively, developed acute dehydration in the course of a diarrhea of undetermined origin In both patients the dehydration caused loss of weight and was associated with nervous disorders (coma or torpor, restlessness, hypertonia, and convulsions) The high degree of hypernatremia indicated a mainly cellular dehydration The diagnosis of subdural effusion was made by exploratory lumbar puncture in one infant and by autopsy in the other Attention is called to the fact that hypernatremia and cellular dehydration caused by diarrhea seem to be aggravated in some cases by a therapy too rich in salt, the renal capacity of infants is insufficient to eliminate the excess of sodium Mixtures of isotonic sodium chloride solution and isotonic dextrose solution in the proportion of 1 to 4 or 1 to 5 are adequate for a standard rehydration when administered at the dose of 100 to 150 cc per kilogram of body weight in 24 hours If the dehydrated infant develops serious nervous disorders the administration of saline solutions must be done with particular caution Isotonic dextrose solution should be administered pure during the first hours of perfusion and should be supplemented with 2 to 3 mEq of sodium per kilogram of body weight in 24 hours Subdural hematomas seem to be the consequence of cerebral collapse caused by hypernatremic dehydration under the circumstances described in this report

WASHINGTON NEWS

Kennedy Election

More Conservatives in Congress

Six MDs Elected

Kennedy on Medical Plans

PRESIDENTIAL ELECTION

The "squeak-through election of Sen John F Kennedy (D, Mass) as President brings to the White House this January a proponent of government medicine for the elderly under the social security program

The Senator repeatedly asserted during the campaign that he would propose a social security health care plan at the next session of Congress Declared the President elect

"People should be able to save for the medical care of their retirement years in the same way that they set aside money for other needs—through the social security system My health plan would extend to our elder citizens a life policy of paid-up medical insurance It would afford them hospital benefits, nursing home benefits, and x-ray and laboratory tests on an out-patient basis

In contrast, Vice-President Richard M Nixon vigorously opposed this approach, asserting 'government must not impose compulsory measures in connection with any health program' Compulsion, said the Vice-President, would be not only contrary to basic American tradition, but also unwise economically and unfair to those preferring private plans

Though both candidates brought up the aged health care issue on occasion, there was no indication it played a large role in the voting

Kennedy's election, however, signaled the possible start of another drive for government medicine in Congress next session, a drive that was overwhelmingly defeated this year

On the other hand, the extreme closeness of the popular vote for Kennedy, and the Republican gains in the House and Senate might lead to a go-slow" attitude in the White House

REPUBLICANS GAIN CONGRESSIONAL STRENGTH

Despite the narrow election of Sen John Kennedy as President, the Republicans picked up additional seats in both House and Senate With the returns still coming in, it appeared the GOP would gain some 24 seats in the House and 2 seats in the Senate This would make the Senate margin 64 to 36 in favor of the Democrats, and the House lineup, 259 Democrats and 178 Republicans

The election results made it clear that there was nothing approaching a mandate from the electorate insofar as Kennedy's victory was concerned The increased conservative membership in Congress also indicated there might be rough sledding during the next Congress for any attempt to put over a compulsory government medicine plan

The past Congress voted against the social security approach for financing health care costs of the elderly and approved, instead, the voluntary, federal-state program of aiding those who need help

With the conservative group's hands strengthened in the House and Senate, the Southern Democrat–Republican conservative coalition could be more potent than ever in the coming Congress

Foremost Congressional opponents of compulsory federal medical schemes won re-election handily including the following members of the key Senate Finance and House Ways and Means Committees Senators Robert Kerr (D, Okla) and Carl T Curtis (R, Neb), Democratic Representatives Wilbur D Mills (Ark), Burr P Harrison (Va), Frank Ikard (Tex), James B Frazier, Jr (Tenn), John C Watts (Ky), and Republican Representatives Noah M Mason (Ill), John W Byrnes (Wis), Howard H Baker (Tenn), Thomas B Curtis (Mo), Victor A Knox (Mich), James B Utt (Calif), Jackson E Betts (Ohio), Bruce Alger (Tex), Albert H Bosch (N Y), and John A Lafore (Pa)

SIX PHYSICIANS ELECTED TO CONGRESS

Six of the 9 physicians who ran for Congress were elected Successful candidates for re-election were Representatives Walter H Judd, Republican, Minnesota, Thomas Morgan, Democrat, Pennsylvania, Iver Fenton, Pennsylvania Republican, and Dale Alford, Arkansas Democrat

Capturing a congressional seat in their first bid were these physicians Durwood Hall, Missouri, Republican, and Edwin R Durno, Oregon, Republican Defeated were Fred A Obley, Pennsylvania, Republican, John D Kaster, California, Democrat, and Floyd M Burgeson, Iowa, Republican

Dr Antonia Fernos-Isern, delegate to Congress from Puerto Rico was re-elected

Another physician in Congress, who was not up for re-election this year, is Sen Ernest Gruening, Alaska, Democrat

KENNEDY'S VIEWS ON FEDERAL MEDICAL PROGRAMS

Here is the program outlined by President-elect John F Kennedy in the medical field

"We must provide federal grants for the construction, expansion, and modernization of medical schools, dental schools, and schools of public health We are graduating only 7,500 doctors a year in the entire country—our hospitals and other facilities are under-staffed—most doctors' offices are overcrowded—and even to maintain the present ratio, we shall need nearly half again as many by 1975 This will require at least 20 new schools as well as expanding present facilities—and had the Republicans not blocked this project in 1955, those schools could be training new doctors today

"We must provide loans and scholarships for medical students There are one-third fewer applicants to our medical schools today than there were in 1950—even though the need for their services is much greater The reason is that a medical education has become too expensive for most young people and their parents—nearly $12,000, not counting the years in undergraduate work before and internship or special studies afterwards Only 1 out of 10 has any kind of scholarship—and the average scholarship is only $500 Low interest loans and fellowships must be made available by the federal government—converting them into scholarships for those willing to devote their talents to fighting disease in the underdeveloped nations—for which we need a new world health center—and those willing to devote their talents in this country to those rural and other areas with a shocking lack of doctors

"We must provide grants for renovating our older hospitals The Hill-Burton act has been responsible for the construction of new hospitals with some 200,000 beds, but new hospitals are not enough Most of our older cities have older hospitals which could be renovated, modernized, and expanded to help meet the load—and grants for this purpose, along with research into improved hospital operation and administration, could bring the cost and the shortage down at the same time

"We must provide long-term grants for increased medical research, including basic research What has already been accomplished in polio and tuberculosis shows what might soon be accomplished for cancer, mental illness, arteriosclerosis, and new ways of prolonging man's productive days instead of just prolonging his life All of this and more is underway But now we must do more—not only more money but longer commitments so that experiments can be planned and equipment bought

'We must expand our efforts for rehabilitation Two million handicapped or disabled people in America today could be rehabilitated if the funds and services were available—but instead we are providing for 88,000"

MISCELLANY

A final tabulation by the American Medical Association showed that appropriations for all of the federal government's medical and health activities during the current fiscal year totaled $3,756,000,000, a sharp jump from the $3,200,000,000 of last fiscal year

The U S Public Health Service reported the number of paralytic cases of poliomyelitis through the first week in November totaled 1,992 cases For the latest week, 119 new cases were reported, down from the 140 of the previous week

The Veterans Administration reported that since Jan 1, 1960, it has registered 710 cases of a tuberculosis-like disease which has come to the attention of physicians in the United States during recent years As yet, the disease has no name more specific than "infections due to unclassified mycobacteria,' the VA said The infections closely simulate tuberculosis and usually affect the lungs Since the prevalence of the disease in the United States is unknown, the VA undertook the task of compiling a case register from the agency's hospitals and clinics on a nationwide basis about a year ago So far, California has reported the highest number of cases, 95, and New York is second with 87

Dr Allyn Winthrop Kimball, professor and chairman of the Department of Biostatistics of the Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md, was appointed to serve a 3-year term on the Advisory Committee on Epidemiology and Biometry of the National Institutes of Health

HOW WOULD YOU DEFINE
the ideal diuretic?

The qualities to be sought in an ideal diuretic have been listed[1] as follows.

"(1) Sustained rather than abrupt violent action

(2) Reduced capacity for electrolyte upheaval.

(3) Convenience of administration, self-administration (oral, rectal, or subcutaneous).

(4) Decreased toxicity (systemic and local irritant action, especially of the gastrointestinal tract)

(5) Effectiveness where others are ineffectual or contraindicated

(6) Applicability in cases with a history of allergic reaction to other diuretics"

It would be rash to term any drug ideal It is safe to say, however, that Aldactone very closely approximates these six requirements. Most importantly, Aldactone often relieves edema and ascites resistant or not optimally responsive to conventional diuretics. By blocking the *action* of the potent salt-retaining hormone, aldosterone, Aldactone, used alone or in synergistic combination with other potent agents, establishes satisfactory diuresis in most edematous patients who have heretofore been considered beyond the help of medical management Aldactone offers a fundamentally new approach to the control of edema in such disorders as congestive heart failure, hepatic cirrhosis, the nephrotic syndrome and idiopathic edema

ALDACTONE® is supplied as compression-coated yellow tablets of 100 mg
(brand of spironolactone)

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[1] Modell, W Am J Cardiol 3 139 (Feb) 1959

Research in the Service of Medicine G D SEARLE & CO.

In induction and [illegible] of labor—method of choice

PITOCIN

[illegible]

Medical News

ARIZONA

Phoenix Surgical Society Lecture —Dr Owen H Wangensteen, 1960 president of the American College of Surgeons and chairman of the department of surgery, University of Minnesota, will be the guest speaker at a meeting of the Phoenix Surgical Society to be held Dec 15, at 8 P M, at Casa Blanca Inn, Scottsdale His subject will be "Extended Operations on the Intestinal Tract All physicians and surgeons are invited to the cocktails and dinner preceding the lecture at 6 30 P M Dinner charge is $5 50 per plate, payable at the door Reservations should be sent not later than a week in advance to Dr William H Cleveland, Secretary, Phoenix Surgical Society, 1313 N 2nd St, Phoenix All who wish to attend the lecture only will be welcome free of charge without reservation

CALIFORNIA

Hospital News —The entire first floor of the new wing of St Francis Memorial Hospital, San Francisco, will soon house the department of radiology Building is scheduled to start in October and the department will be ready for occupancy early in 1961 It is estimated that the construction cost of the project will require a capital outlay in the neighborhood of about $3,000,000 and that the cost of equipment will be an additional $150,000 This floor was originally designed for radiology when the wing was constructed but funds were not available in 1957 when the building was completed

Radiologists to Meet in Los Angeles —The 13th annual Midwinter Radiological Conference, sponsored by the Los Angeles Radiological Society, will be held at the Biltmore Hotel, Los Angeles, on Saturday and Sunday, Jan 28 and 29 Guest speakers will be Dr James W D Bull, London, England, Dr John Boland, New York, Dr John A Kirkpatrick Jr, Philadelphia, and Dr John F Holt, Ann Arbor, Mich The conference fee of $20 will include two luncheon meetings featuring questions and answers A banquet ($7 50 per plate) preceded by cocktails will be held Saturday evening Reservations may be made through Dr Joseph A Parks Jr, 14500 Sherman Circle, Van Nuys, Calif Courtesy cards will be available to residents in radiology and radiologists in the Armed Forces by advance registration, with reduced tariff for the luncheons and banquet Hotel reservations should be made promptly through the Convention Manager, Biltmore Hotel, Los Angeles

ILLINOIS

Chicago

Dallas B Phemister Memorial Lecture —The 4th Dallas B Phemister Memorial Lecture will be given by Dr Henry N Harkins, professor and executive officer, department of surgery, University of Washington, Seattle, on Nov 29 at 5 P M in the Billings Hospital Auditorium, Chicago His subject will be "The Surgical Treatment of Duodenal Ulcer Physiologic Basis and Present Status' Medical students, interns, residents, and physicians are invited

Carlson Memorial Fund —The Carlson Memorial Fund of the University of Chicago, in memory of the late Dr Anton J Carlson, is in a position to support an annual A J Carlson Memorial Lecture at the University of Chicago, according to Dwight J Ingle, Ph D, chairman of the fund It is proposed that earnings of the Carlson Memorial Fund not used for the annual lecture be used for the Carlson Memorial Library The fund can be aided in two ways First, by a direct contribution and, second, by gifts of bound or unbound scientific and medical journals Duplicates or unneeded journals received as gifts will be sold to a dealer of secondhand journals and the money received will be added to the Carlson Memorial Fund

Dr Brewer Receives Charles A Griffin Award — The Charles A Griffin Award for 1960 was presented at the 11th annual meeting of the Animal Care Panel to Nathan Brewer, Ph D, of the University of Chicago, in recognition of his pioneering work in furthering the discipline of laboratory animal care The award was presented by Bennett J Cohen, Ph D, Los Angeles, ACP President Dr Brewer is associate professor in the department of physiology and superintendent of animal quarters at the University of Chicago The Charles A Griffin Award was established in 1956 to honor the late Charles A Griffin, veterinary bacteriologist at the New York State Department of Health Laboratories in Albany, N Y, who devoted much of his outstanding career to developing colonies of laboratory animals free from any serious infectious disease The award is presented annually to the person who most significantly advances the concepts of improved laboratory animal qualities

Dr Davis Named Chairman ACS Board of Regents —Dr Loyal Davis, Chicago, has been appointed chairman of the Board of Regents of the American College of Surgeons The announcement was made by Dr Paul R Hawley, director of the college, at

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Physicians are invited to send to this department items of news of general interest for example those relating to society activities new hospitals education and public health Programs should be received at least three weeks before the date of meeting the closing session of the college's 46th annual clinical congress In this new office, Dr Davis succeeds Dr Isidor S Ravdin, Philadelphia, incoming president of the college Internationally known as a neurosurgeon, educator, editor, and fighter against unethical surgical practices, Dr Davis is professor of surgery, and chairman of the division of surgery, Northwestern University Medical School, attending surgeon, Passavant Memorial Hospital, Chicago, consulting surgeon, Veterans Administration Research Hospital, Chicago, and editor of *Surgery, Gynecology & Obstetrics* Dr Davis has been a member of the Board of Regents of the college since 1950, and vice-chairman since 1957

LOUISIANA

Graduate Medical Assembly Planned.—The 24th annual meeting of The New Orleans Graduate Medical Assembly will be held March 6-9, 1961, with headquarters at The Roosevelt Hotel Nineteen guest speakers will participate and their presentations will be of interest to both specialists and general practitioners The program will include 57 informative discussions on many topics of current medical interest, in addition to clinicopathologic conferences, symposiums, medical motion pictures, round-table luncheons, and scientific and technical exhibits After the meeting in New Orleans, arrangements have been made for a clinical tour of the Orient, leaving New Orleans by air on March 10, to make a connection with a jet flight leaving Los Angeles at night The itinerary includes visits to Hawaii, the Philippines, Hong Kong, and Japan, returning on March 30 to gateway city of choice—Los Angeles, San Francisco, or Seattle Details of the New Orleans meeting and the tour are available at the office of the Assembly, Room 103, 1430 Tulane Ave, New Orleans 12

MARYLAND

Dr Jacob Conn Receives Hypnosis Award—Dr Jacob H Conn, assistant professor of psychiatry, Johns Hopkins University Medical School, was presented with the Award of Merit by the National Society for Clinical and Experimental Hypnosis for the best contribution to clinical hypnosis in 1960 He also was elected chairman of the society's three Examining Boards of Clinical Hypnosis (dental, psychological, and medical) and president of the Board of Medical Hypnosis at the 12th annual meeting of the society in Washington, D C, in October

Faculty Appointment—The appointment of Dr Walter H Sheldon as professor of pathology at Johns Hopkins University School of Medicine has been announced by Milton S Eisenhower, president of the university Dr Sheldon is professor of pathology and chairman of the department of pathology at Emory University Dr Sheldon received his medical degree from the University of Catania, Sicily, in 1935 In 1943, he joined the medical faculty of Emory University as assistant professor of pathology and received successive appointments as associate professor in 1947 and full professor and head of the department of pathology in 1949

MINNESOTA

Medical Scientists Honored by Medical Foundation—Two of the University of Minnesota's foremost medical educators and scientists were recipients of the first Distinguished Service Awards of the Minnesota Medical Foundation given Sept 26 in ceremonies at the university's medical school Dr Maurice B Visscher and Dr Owen H Wangensteen were honored by surprise with certificates and accompanying awards which will pay them each $5,000 annually until retirement The awards were presented by Dr Herman E Drill, Hopkins, Foundation president, during the annual Minnesota Medical Foundation Day ceremonies Drs Visscher and Wangensteen were cited "for exemplary achievement in teaching and research as members of the faculty of the University of Minnesota medical school, and for steadfast devotion to the medical school, the University and to medical education" Dr Visscher, 59, has been head of the university's department of physiology since 1936 His award was made possible by a grant from the Modern Medicine Publications Foundation Dr Wangensteen's award was a contribution of the Phillips Foundation of Minneapolis He is 62 years old and has been chairman of the University of Minnesota's department of surgery since 1930 Normal retirement age for faculty members is 68 years University President O Meredith Wilson said he would recommend the Distinguished Service Awards be designated Distinguished Service Professorships by the university's Board of Regents, thus heightening the honor by affording full academic recognition This was accomplished a week later

MISSOURI

A Morris Ginsberg Memorial Seminar—The department of medicine of the Menorah Medical Center will hold its annual A Morris Ginsberg Memorial Seminar on Dec 1 and 2, 1960 The guest this year will be Dr E Grey Dimond, director, Institute for Cardiopulmonary Diseases, Scripps Clinic and Research Foundation, La Jolla, Calif All physicians are invited to attend The general subject will concern cardiology

Medical Care Research Center—The Medical Care Research Center, established earlier this year as a joint venture of the Social Science Institute of

Washington University and Jewish Hospital, has been awarded a 5 year $564,518 United States Public Health Service grant Co-investigators of the research program are Dr David Littauer, St Louis executive director, Jewish Hospital, and Nicholas J Demerath, Ph D , director, Washington University Social Science Institute The center will encourage cooperative research activities by professional medical and administrative persons and social scientists in studies of the organization and administration of health services in the general hospital and the community

New Psychiatric Ward Opened—A new psychiatric ward at the University of Missouri Hospital was officially opened for use Oct 17, with provisions for all modern methods of psychiatric treatment, including individual and group psychotherapy and appropriate medicines The ward has 18 beds Dr James M A Weiss, associate professor of psychiatry and acting chairman of the department, and Dr David Davis, assistant professor of psychiatry, will have supervision of the new ward Dr Weiss said it will be an open ward with no locked doors, on the basis of research in the last 10 years in both the United States and England which has shown that the open psychiatric ward has proved most successful Further, the ward has been equipped in a modern style with attractive rooms, some of which are furnished in a home-like manner in order to give patients as much feeling of home life as possible Patients will be accepted for treatment in the psychiatric ward only on the referral of their private physician, as is the practice in accepting patients for the rest of the University Hospital

Personal—Dr Robert L Jackson, professor and chairman of the department of pediatrics at the University of Missouri, will serve for the next 3 years on the editorial board of *Diabetes*, the official journal of the American Diabetes Association, Inc , for New York City He will also be a member of the editorial advisory board of *Forecast*, a pocket-size magazine published by the Association ——The appointment of Dr Norman J Johnson, Williamson, W Va , as medical director of the Missouri State Crippled Children s Service and associate professor of public health and preventive medicine in the school of medicine has been announced Dr Johnson has assumed his duties He replaces acting medical director of the service, Dr Vernon E Wilson, Kansas City, Kan , dean of the school of medicine and director of the medical center, who temporarily assumed the director s duties following the June 14 resignation of Dr Owen A Kearns Dr Johnson was assistant professor of pediatrics for one year at the University of Tennessee division of pediatrics located in Memphis before coming to the University of Missouri

NEW JERSEY

Dr Edward Sprague Receives College of Surgeons Award—The Distinguished Service Award of the American College of Surgeons for 1960 has been presented to Dr Edward W Sprague, of Newark, N J At the annual meeting of Fellows, Dr Owen H Wangensteen, Minneapolis, president of the college, presented the award which reads 'For his long and faithful service on essential committees of the College, for his contributions as a Governor for many years, for his unceasing efforts to elevate the quality of patient care in his State, and for his devotion to and exemplification of the ideals of the American College of Surgeons for 41 years, the Distinguished Service Award for 1960 is conferred upon Edward W Sprague, M D , F A C S , by the unanimous vote of the Board of Regents" Dr Sprague is senior attending surgeon at Martland Medical Center, Presbyterian, St James' and Babies Hospitals in Newark, consulting surgeon at Irvington General Hospital and Mountainside Hospital in Montclair

NEW YORK

Suffolk Sanatorium Closes—The closing of the Suffolk Tuberculosis Sanatorium at Holtsville, Suffolk County, effective Dec 31, was announced by the State Health Department The 103-bed sanatorium, which has been open since 1921, has been operated by Suffolk County for the care of tuberculosis patients in the county The announcement of the closing was made after Dr Herman E Hilleboe, Albany, State Health Commissioner, approved an application from the Suffolk County Board of Supervisors requesting permission to discontinue the facility Tuberculosis care for residents of Suffolk County will be provided by the Nassau County Sanatorium at Farmingdale Chest clinic services in Suffolk County will be continued under county auspices

Personal—Dr Lee B Lusted, associate professor of radiology at the University of Rochester School of Medicine and Dentistry, has been named chairman of a National Institutes of Health Advisory Committee on Computers in Research Dr Lusted will counsel on the numerous bio-medical computer grant applications and advise Dr James A Shannon, director of the National Institutes of Health, on the role that N I H should play in support of research involving the use of computers ——Dr Jacob Furth, director of experimental pathology, Roswell Park Memorial Institute, delivered the Harrington Lecture at the University of Buffalo, on Nov 10 His topic was "Perspectives of Hormonal Control of Neoplasms'

Dr J Glaser Honored in Chicago—Dr Jerome Glaser, of Rochester, N Y, was honored by the

Section on Allergy of the American Academy of Pediatrics at a meeting held in Chicago, Oct 16 Dr Harry L Mueller of Boston, Mass, chairman of the allergy section, presented Dr Glaser with a scroll which read as follows "By unanimous vote of the Section on Allergy of the American Academy of Pediatrics assembled in Chicago at the 29th annual meeting of the academy, this Scroll is awarded to Jerome Glaser, M D, as an expression of gratitude and appreciation for his untiring services in advancing the study of pediatric allergy for his brilliant teaching of pediatric allergy at the University of Rochester School of Medicine and Dentistry and in this academy for many years as originator of the plan which ultimately led to the formation of what is now the Allergy Foundation of America as author of the first comprehensive textbook on allergy in childhood as a pioneer investigator in advancing our knowledge of the prophylaxis of allergic disease'

New York City

Dr Critchley to Give Israel S Wechsler Lecture —Dr Macdonald Critchley, senior physician of the National Hospital for Nervous Diseases, Queen Square, London, and neurologist of King's College Hospital, London, England, will deliver the 6th annual Israel S Wechsler Lecture on Dec 9 at 8 30 P M in the Blumenthal Auditorium of the Mount Sinai Hospital, New York City Dr Critchley's lecture is entitled "The Nature of Animal Communication and its Relation to Language in Man"

Rudolf Virchow Society Celebrates Centennial —The Rudolf Virchow Medical Society in the City of New York, formerly known as the German Medical Society, held its centennial meeting on Nov 7 at the New York Academy of Medicine The main address, the Rudolf Virchow Lecture, was given by Dr Rudolf Nissen, professor of surgery, University of Basel, Switzerland His subject was "The Development of Lung Surgery" The Society, which started on Dec 19, 1860, as a small discussion group of German physicians practicing in New York City, now has more than 750 members Monthly meetings are held in the *Academy of Medicine* and the papers presented are published annually in the Proceedings of the Rudolf Virchow Medical Society

Personal —Dr Alexander H Leighton, professor of social psychiatry and anthropology at the Cornell University Medical School, was this year's John Barclay Biddle Lecturer at Jefferson Medical College, Oct 25-26 Dr Biddle was dean at Jefferson (1873-1878) ——The appointment of Dr Lewis Thomas, chairman of the department of medicine, New York University Medical Center, to a 4-year term on the National Advisory Health Council has been announced by Surgeon General Leroy E Burney of the Public Health Service, U S Department of Health, Education, and Welfare In his appointed capacity Dr Thomas will make recommendations to the Surgeon General on matters relating to the functions of the Public Health Service, and will advise on the activities of the Division of General Medical Sciences of the National Institutes of Health A prime function of the council is to review applications for grants to perform research in the sciences basic to medicine and biology, in environmental and public health, and in certain clinical sciences

Influenza Vaccination Recommended —New York City physicians are being urged to consider giving influenza vaccine to patients suffering from chronic debilitating diseases, to all those over 65 years of age, and to pregnant women The recommendation is contained in a letter now being sent to the 18,000 physicians of New York City by Dr Samuel Wagreich, chairman of the Coordinating Council of the 5 county medical societies of New York City, and Dr Leona Baumgartner, commissioner of the Department of Health The letter from Dr Wagreich and Dr Baumgartner points out that a pandemic of influenza occurred in New York City from October through December, 1957, and was followed by epidemics of influenza January through March, 1958, and January through March, 1960 "Because of the lethal impact of influenza upon certain groups in the population' the United States Public Health Service advises that persons in these vulnerable groups be vaccinated against influenza Vaccination, Dr Baumgartner said, should be given by a physician knowing the condition of the person being vaccinated The Department of Health does not plan a community-wide anti-flu vaccination program

NORTH CAROLINA

Society News —The following officers were elected at a recent meeting of the **North Carolina Urological Association** president, Dr John E Dees, Durham, vice-president, Dr Benjamin B Langdon, Fayetteville, secretary-treasurer, Dr Jack Hughes, Durham ——At the fall meeting the **North Carolina Radiological Society** the following officers were elected president, Dr Isadore Meschan, Winston-Salem, president-elect, Dr Owen W Doyle, Greensboro, vice president, Dr Simmons I Patrick, Kinston, secretary-treasurer, Dr Arthur B Croom, High Point

Faculty Appointments —The appointment of 3 new faculty members in the Duke University Medical Center's biochemistry department has been announced by Robert T Cole Ph D, provost of the university Charles Tanford, Ph D , has joined the biochemistry faculty as professor of physical biochemistry, Ralph E Thiers, Ph D , as associate professor of biochemistry and associate director of Duke Hospital's clinical chemistry laboratory, and Walter R Guild, Ph D , as associate professor of biophysics The promotion of Dr Robert W Wheat to assistant professor of biochemistry also was announced Dr Tanford was professor of physical chemistry at the State University of Iowa before coming to Duke He received the Ph D degree from Princeton Dr Thiers holds the Ph D degree from the University of Toronto Before joining the Duke faculty he was a member of the Harvard University Medical School faculty and director of the chemistry laboratory of Peter Bent Brigham Hospital in Boston Dr Guild taught at Yale University before coming to Duke He holds the Ph D degree from Yale

OHIO

Dr Richard Vilter Receives Goldberger Award — Dr Richard W Vilter, a University of Cincinnati researcher, is this year's recipient of the award, jointly presented by the American Medical Association and the Nutrition Foundation, honoring the memory of pioneer nutritionist Joseph Goldberger The award carries an honorarium of $1,000 The title of Dr Vilter's paper was "The Role of the Vitamins in the Etiology and Treatment of Anemia "

Personal —Dr Robert M Zollinger, Columbus Ohio, professor and chairman of the department of surgery, Ohio State University College of Medicine, was named president-elect of the American College of Surgeons at the annual meeting of Fellows Dr Zollinger will succeed Dr Isidor S Ravdin, Philadelphia, vice-president for medical affairs at the University of Pennsylvania, who became president at the meeting

Industrial Health Fellowships —The University of Cincinnati's Institute of Industrial Health is offering graduate fellowships in industrial medicine The Institute, which is in the College of Medicine, provides professional training for graduates of approved medical schools who have completed at least one year of internship The 3-year program leading to the degree of Doctor of Industrial Medicine satisfies the requirements for certification in occupational medicine by the American Board of Preventive Medicine Two years are devoted to academic and clinical study in the field of industrial medicine, and the third is spent in residency in an industrial medical department or in some comparable organization Stipends for the first 2 years vary from $3,000 to $4,000 depending on marital status In the final or residency year the fellow is compensated by the organization in which he is completing his training Requests for additional information should be addressed to The Secretary, Institute of Industrial Health, College of Medicine, Eden and Bethesda Aves , Cincinnati 19, Ohio

OKLAHOMA

Alumni Association Meeting —Alumni of the University of Oklahoma School of Medicine observed the 50th anniversary of the foundation of the 4-year school Oct 23 at their annual membership meeting and banquet in Oklahoma City Dr Robert M Howard, 82, Oklahoma City surgeon, received the Alumni Association's annual "Professor Emeritus of the Year" award He was a member of the original faculty Dr Wilburt F Lewis, Lawton, Okla , took office as alumni president, succeeding Dr John R Taylor, Kingfisher, Okla

PENNSYLVANIA

State Medical Election —The following officers were elected at a recent meeting of the Pennsylvania Medical Society president-elect, Dr Daniel H Bee, Indiana, Pa , first vice president, Dr Roy W Gifford, Gettysburg, second vice president, Dr Charles J H Kraft, Meshoppen, third vice president, Dr C Reginald Davis, Johnstown, fourth vice president, Dr William J Yevitz, Scranton secretary, Dr Harold B Gardner, Harrisburg, speaker of the House, Dr Gilson Colby Engel, Philadelphia, vice speaker of the House, Dr Horace W Eshbach, Drexel Hill, trustee, third councilor district, Dr Dudley P Walker, Bethlehem, trustee, ninth councilor district, Dr Connell H Miller, Sligo

Personal —Dr Sidney Cobb, associate professor of epidemiology, Graduate School of Public Health, University of Pittsburgh, has been appointed to serve a 4-year term on the Advisory Committee on Epidemiology and Biometry of the National Institutes of Health, U S Public Health Service As a member of the committe, Dr Cobb will review applications for training grants in the fields of epidemiology and biometry The program supports research training for predoctoral and postdoctoral trainees, and medical and dental students in their free time, in statistical methods in epidemiology, demographic methods in public health, dental epidemiology, sources of date of epidemiologic study, biostatistics, bioassays, medical research design, statistical methods in research on various disease, and other related fields

Dr Ravdin Named President of American College of Surgeons —Dr Isidor S Ravdin, vice president for medical affairs at the University of Pennsylvania, was presented with a special honor on the occasion of his retirement as chairman of the Board of Regents of the American College of Surgeons in a suprise ceremony Oct 8 A bound Book of Letters, the first of which was written by President Dwight D Eisenhower, and containing letters from past presidents of the college, current and past members of the Board of Regents, and executive staff, was presented to Dr Ravdin at a luncheon The presentation was made by Dr William H Parsons, Vicksburg, Miss, a member of the Board of Regents, Dr Paul R Hawley, Chicago, director of the college, and Lieut General Leonard D Heaton, Surgeon General, United States Army In his leading letter President Eisenhower said, "On the occasion of your retirement as Chairman of the Board of Regents of the American College of Surgeons, I have asked General Heaton to carry this personal note to you in San Francisco Over the years, in your special field of surgery—and in the wider field of humanity—you have won the respect and affection of all who know you I am delighted to take part in this tribute to your work and spirit" Dr Ravdin assumed the presidency of the American College of Surgeons Oct 14 during the closing session of the college's 46th annual clinical congress

Philadelphia

Physicians Dinner at Philadelphia General Hospital.—The 74th annual dinner of the Association of ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held on Tuesday, Dec 6 at 7 P M at the Summit Club, Barclay Building, City Line and Belmont Ave, Bala-Cynwyd, Penna For information, write Dr William W Wilson, 133 South 36th St, Philadelphia 4

PUERTO RICO

Reduction in Dental Decay Reported—A comparison of surveys made in 1952 and 1958 is the basis for a recent report by the Commonwealth Department of Health which reveals that there has been a 65% reduction in the incidence of tooth decay among children in Puerto Rico since 1953 as a result of its fluoridation program

TEXAS

Dr Samuel Snodgrass Elected to Presidency—Dr Samuel R Snodgrass, professor of neurosurgery at the University of Texas Medical Center, has been elected president of the American Academy of Neurological Surgery Dr Snodgrass received his M D degree from Indiana University He joined the faculty of the University of Texas as assistant professor in 1937 He was a fellow in neurological surgery at Washington University and worked at the National Hospital, Queen Square, London, on a Rockefeller Foundation Traveling fellowship in neurology

VERMONT

State Medical Election—The 147th annual meeting of the Vermont State Medical Society was held at the Mount Washington Hotel, Bretton Woods, N H, on Oct 6-9, 1960 New officers are president, Dr Benjamin F Clark, St Johnsbury, president elect, Dr Roger W Mann, Jeffersonville, vice president, Dr John R Hogle, Brattleboro, secretary, Dr Oliver H Durand, Bennington, and treasurer, Dr John R Williams, Rutland

GENERAL

Jobs for Disabled—A record total of 88,275 disabled persons were prepared for and placed in successful employment through the State-Federal program of vocational rehabilitation in the year ended June 30 last, a gain of 9% over the preceding fiscal year when 80,720 persons were so placed

Traffic Deaths and Injuries.—Traffic deaths in the United States totaled 27,440 in the first 9 months of this year, the National Safety Council reported This was 220, or 1%, more than the toll of 27,220 recorded in the same period last year Disabling injuries resulting from traffic accidents in the 9-month period were estimated by the council at 1,000,000

Pediatric Residency Fellowships—Wyeth Laboratories are inviting applications for 20 Pediatric Residency Fellowships Recipients of the 2-year $4,800 grants will serve residencies in pediatrics in accredited hospitals beginning July 1, 1961 Applications should be submitted not later than Nov 30, 1960 to Dr Philip S Barba, School of Medicine, University of Pennsylvania, Philadelphia 4

Surgeons' Meeting in Colorado—The annual meeting of the Rocky Mountain Traumatic Surgical Society will be held in Aspen, Colo, Jan 26-28 The Trauma Committee of the American College of Surgeons (Rocky Mountain Section) will participate in this meeting, by invitation Those interested in attending should contact the Aspen Travel Service for reservations, identifying the meeting

Increase in Mental Health Budget—Shortly before adjournment, the Congress voted $100,900,000 for the National Institute of Mental Health for the coming year The increase of approximately $33 million over the Administration budget figure is by far the largest ever received by the institute It is also much greater than the increases voted to any of the other components of the National Institutes of Health

Psychoanalyst to Lecture in New York—"Kairos and the Therapeutic Process" will be the subject of a paper by Dr Harold Kelman, New York City dean of the American Institute for Psychoanalysis, to be given on Wednesday, Jan 25, 1961, 8 30 P M, at the New York Academy of Medicine, 2 East 103rd St, New York City The discussants will be Drs Charles R Hulbeck, New York City, and Joseph W Vollmerhausen, New York City, both practicing psychoanalysts

Medical Education to Benefit from Commonwealth Fund–The Commonwealth Fund plans to curtail its grants for medical research and increase its support for medical education and other community health activities, according to the annual report just published This decision is due in part to a staff study that showed there is "greatly increased availability of support" for research from the Federal Government and from pharmaceutical companies The Commonwealth Fund will continue to consider aid requests for special projects at a stage too early to command help from other sources

Medical Periodicals Needed Overseas–American physicians are asked to cooperate with the World Medical Association in a program to provide medical periodicals and books to foreign libraries, medical groups, and hospitals Physicians are asked to give the W M A the names of periodicals which they are willing to send overseas at regular intervals The W M A will then send the donor a supply of wrappers addressed to a foreign doctor who wants that particular publication Further information may be obtained from W M A, United States Committee, Inc, 10 Columbus Circle, New York 19

Conference on Existential Psychiatry–There will be two conferences on existential psychiatry held under the auspices of the Chicago Ontoanalytic Society and the American Ontoanalytic Association The first meeting will be on Dec 11, Carnegie Endowment Center, New York City, and the second will be on May 7, 1961, immediately prior to the annual American Psychiatric Association meeting in Chicago Those interested may contact Dr Jordan M Scher, 679 N Michigan Ave, Chicago 11, for additional information

Physician Visits per Person per Year–Persons living in the United States made approximately 5 physician visits per person per year during the 2-year period July 1957-June 1959, according to the U S Public Health Service This represents an average of about 851 6 million visits per year Approximately 66% of the visits took place in a physician's office, 10% at home, and 9% in a hospital out-patient clinic About 10% of all visits were telephone consultations This information is contained in a report based on nation wide household interviews conducted by the U S National Health Survey Interviews were conducted in approximately 73,000 households throughout the country and included about 235,000 persons

Presse Medicale Film Prize–The annual prize for medico-surgical film, having a cash value of 1,000 new francs, will be awarded during the last session of the course on 'Actualités Médico-Chirurgicales at the Nouvelle Faculté de Médecine de Paris on March 14, 1961 The jury will consider the didactic value of the film as well as its cinegraphic quality Only 16 mm films may be submitted The projection time must not exceed 30 minutes Applications and films should be sent to the Secrétariat du Journal La Presse Médicale, 120 Bd Saint-Germain, Paris VI°, before Feb 1, 1961 All films may be exhibited, including those subsidized or produced by a laboratory or firm

Albert Lasker Awards for 1960–Seven medical researchers have been selected to receive the 1960 Albert Lasker Awards for medical research The award consists of an honorarium of $2,500, a gold statuette of the Winged Victory of Samothrace, symbolizing victory over death and disease, and a citation The awards were presented formally at the 88th annual meeting of the American Public Health Association in San Francisco on Nov 3 The recipients named are Dr James V Neel, University of Michigan, Dr Lionel S Penrose, University of London, England, Francis H C Crick, Cambridge University, England, James D Watson, Ph D, Harvard University, Maurice H F Wilkins, King's College, London, Ernst Ruska, Berlin Institute of Technology, and James Hillier, Ph D, R C A Research Laboratories

Ophthalmology and Otolaryngology Exhibit Awards–An exhibit 'Chamber Angle Anomalies in Developmental Glaucoma and in Systemic Mesodermal Disorders" from the departments of ophthalmology and orthopedic surgery of the College of Medicine, State University of Iowa, was given First Award in Ophthalmology at the 65th annual meeting of the American Academy of Ophthalmology and Otolaryngology held in Chicago 'Surgical Treatment of Hearing Loss,' an exhibit presented by the Memphis Society of Otology, was given the First Award in Otolaryngology Second awards were presented to Dr Louis J Girard, Hilda H Fox, and Dr Charles D Dukes of Baylor University College of Medicine, Houston, Texas, for their ophthalmology exhibit Interference Cinemicrography of Ocular Tissues,' and to the United States Army Medical Service at Fitzsimmons General Hospital for their otolaryngology exhibit "Fibrosing Mastoiditis" Third award in ophthalmology was given to Walter Reed Army Hospital and the National Institutes of Health for their exhibit Color Television Photography of the Fundus Oculi' Temple University School of Medicine and Hospital took third award in otolaryngology for Otologic Microsurgery Otosclerosis Surgery and Tympanoplasty"

Prevalence of Poliomyelitis—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated

Area	Oct 29 1960 Paralytic Type	Oct 29 1960 Total Cases	Oct 31 1959 Total
New England States			
Maine	4	5	9
New Hampshire			
Vermont			
Massachusetts			4
Rhode Island	1	2	2
Connecticut			1
Middle Atlantic States			
New York	8	11	2[illegible]
New Jersey	[illegible]	4	2
Pennsylvania	6	8	11
East North Central States			
Ohio	2	[illegible]	13
Indiana		8	6
Illinois		2	18
Michigan	4	[illegible]	12
Wisconsin	2	3	1
West North Central States			
Minnesota	2	[illegible]	7
Iowa			[illegible]
Missouri	4	4	2
North Dakota			
South Dakota			
Nebraska			2
Kansas			
South Atlantic States			
Delaware			1
Maryland	[illegible]	7	2
District of Columbia	[illegible]	3	
Virginia	4	4	7
West Virginia	4	4	9
North Carolina		1	1[illegible]
South Carolina	1	1	[illegible]
Georgia	1	1	4
Florida	2	2	6
East South Central States			
Kentucky		7	8
Tennessee	1	3	[illegible]
Alabama			[illegible]
Mississippi	6	6	[illegible]
West South Central States			
Arkansas	2	2	[illegible]
Louisiana			7
Oklahoma			4
Texas	1	[illegible]	10
Mountain States			
Montana		2	3
Idaho		1	
Wyoming			
Colorado			1
New Mexico			4
Arizona			1
Utah		1	
Nevada			
Pacific States			
Washington	1	1	12
Oregon		1	9
California	9	9	19
Alaska			
Hawaii			
Territories and Possessions			
Puerto Rico	[illegible]	3	
Total	82	122	287

International Academy of Proctology Award Contest—The International Academy of Proctology announces its annual cash prize and certificate of merit award contest for 1960-1961 The best unpublished contribution on proctology or allied subjects will be awarded $100 and a certificate of merit The winning contribution will be selected by a board of impartial judges, and all decisions are final The formal award of the first prize, and presentation of other certificates, will be made at the annual convention dinner dance of the International Academy of Proctology, April 12, 1961, at the Drake Hotel, Chicago The International Academy of Proctology reserves the exclusive right to publish all contributions in its official publication, *The American Journal of Proctology* All entries are limited to 5,000 words, must be typewritten in English, and submitted in 5 copies All entries must be received no later than February, 1961 Entries should be addressed to Dr Alfred J Cantor, executive officer, International Academy of Proctology, 147-41 Sanford Ave, Flushing 55, N Y

Fellowships for Research in Clinical Nutrition—

The Council has authorized publication of this announcement These fellowships are sponsored by the Nutrition Foundation Inc in cooperation with the Council In 1961 10 fellowships will be given in honor of Dr Richard W Vilter recipient of the 1960 Joseph Goldberger award in Clinical Nutrition

PHILIP L WHITE, Sc D, *Secretary*

Purpose—The purpose of these fellowships is to stimulate staff members and students of schools of medicine to take a more active interest in the science of nutrition

Amount—The amount of money available is $200 per month for three months

Conditions—Fellowships will be granted under the following conditions 1 The grant shall be made to a medical student on recommendation of a senior investigator 2 The recipient will be selected by the Council 3 The grant shall be used solely for remuneration of the selected medical student 4 The grant shall be limited to a period not to exceed three months during the nonacademic portion of the school year 5 No senior investigator may have more than one student per year receiving a grant 6 Only a brief progress report or summary will be required Publication will be at the discretion of the senior investigator

Application—1 Application should be made in writing by the senior investigator to Council on Foods and Nutrition, American Medical Association, 535 N Dearborn St, Chicago 10, on or before Dec 15, 1960 2 Application shall include (a) brief outline of study proposed, (b) assurance that adequate physical facilities are available, and (c) identification of a qualified medical student and assurance of his availability

Society News—The **American Academy for Cerebral Palsy** held its 13th annual meeting in Pittsburgh, Oct 5-7 The newly elected officers for 1960-1961 are president, Dr George W N Eggers, Galveston, Texas, president-elect, Dr Jessie Wright, Pittsburgh, vice-president, Dr H Russell Meyers, Iowa City, Iowa, secretary, Dr Joseph D Russ New Orleans treasurer, Dr Samuel B Thompson Little Rock, Ark The 1962 annual meeting will be held in St Louis, Mo, at the Chase & Park Plaza Hotels on Nov 9-11, 1962 —At the annual meeting of the **Society for Pediatric Radiology**, held in Atlantic City, N J, on Sept 26, Dr John F Holt Ann Arbor, Mich, was installed as president for the year 1960-1961 Dr Arthur S Tucker, Cleveland, Ohio, was chosen president-elect Dr Richard G Lester, Minneapolis, was re-elected secretary treasurer The next annual meeting of the society is scheduled for Sept 25, 1961, in Miami Beach, Fla —Dr Charles H Frantz, Grand Rapids, Mich , took office as president of the **Clinical Orthopaedic Society** at the closing session of the society's 3-day annual meeting in Milwaukee on Oct 22 Dr Frantz succeeded Dr Fred C Reynolds, of Owensboro, Ky Other officers named by the group are vice president, Dr Marvin P Knight, Dallas, Tex , and secretary treasurer, Dr Lyman W Smith, Elgin, Ill Dr Robert H Denham Jr , South Bend, Ind , was elected to a 3-year term on the membership committee and Dr James S Miles, of Denver, Colo , to a 4 year term on the committee Dr C Fred Ferciot, of Lincoln, Neb , succeeded Dr Wallace S Duncan, of Cleveland, O , as senior member of the membership committee The 1961 annual meeting of the society will be held in Dallas, Tex , Oct 26 28

CANADA

Regional Meeting in Saskatoon —The Prairie Provinces Regional Meeting of the American College of Physicians will be held in Saskatoon, Saskatchewan Nov 25 26 Papers by invited authors include the following

Hypertension and Renal Artery Stenosis, Dr G E Sinclair, Regina
Experience in Extra corporeal Hemodialysis Dr M A Baltzan, Saskatoon
Diagnostic Considerations in Diabetes Insipidus Dr Donald R Wilson, and Dr G Pinsecki, Edmonton
Polycythemia Rubra Vera and Myxedema, Dr B J Sproule and Dr John Brady, Edmonton
Studies of Effect of Glucose upon the Release of Fatty Acids by Adipose Tissue, Dr J Moorhouse, Winnipeg
The Critical Opening Pressure of Small Vessels in Normal and Hypertensive Subjects, Dr Peter Gaskell Winnipeg
Unusual Complications of Long-term Anticoagulant Therapy, Dr Violet M Storne, Winnipeg
Research Progress in Anticoagulant Compounds, L Jacques, Ph D , F R S C , Saskatoon

J W T Spinks, Ph D , D Sc , president of the University of Saskatchewan, will be guest speaker at the luncheon on Friday Dr Edward C Rosenow Jr , executive director, American College of Physicians, will contribute to the program and is featured as the dinner speaker For information write Dr D M Baltzan, MacMillan Building, Saskatoon, Saskatchewan

FOREIGN

Blind Trained as Physical Therapists in U K— Blind persons in Great Britain are being trained to become physical therapists This not only gives the blind a useful occupation but also helps to fill a growing demand for therapists At present 300 ex-students of the Royal National Institute for the Blind are employed as therapists Teaching methods include lectures, manual demonstrations, and instruction in special equipment and devices fitted with Braille numerals

Australian and Briton Share Nobel Prize —The 1960 Nobel Prize for Medicine has been awarded to Sir Frank Macfarlane Burnet, O M , F R S , of Melbourne, Australia, and Professor Peter B Medawar, C B E , F R S , of London, for their work on tissue transplantation They will share the prize worth $43,627 Sir Macfarlane Burnet is director of the Walter and Eliza Hall Institute for Medical Research and professor of experimental medicine in the University of Melbourne Professor Medawar is Jodrell professor of zoology and comparative anatomy at University College, London

Scientific Congress on Aerosols —The 4th Scientific Congress on Aerosols will be held in Bad Lippspringe/Westfalen April 20-22, 1961 The theme of the congress will be 'New Results of Biologic Studies on Substances in Suspension' Three groups of lectures will deal with (1) the basis of research on aerosols, (2) the harmful effects of aerosols in present day civilization, and (3) their beneficial effects The congress will be arranged in cooperation with the Fraunhofer Society for the Promotion of Applied Research in Munich The scientific program will be organized by Dr H Nuckel, Bad Lippspringe/Westfalen, Arminiuspark 3a, Congress Bureau, Germany

New Chemotherapy Journal to be Published —A new publication entitled *Chemotherapia*, the International Journal of Pharmacology, Toxicology, Symptomatology, and Therapy, is to be published by S Karger, Ltd , of Basel, Switzerland The journal will publish papers dealing with experimental and clinical progress and problems of modern chemotherapy with special attention to clinical pharmacology and toxicology *Chemotherapia* will be the official organ of the International Symposium of Chemotherapy, which held its first meeting in Geneva in September, 1959 The journal will be published bimonthly and will cost $13 50 The editors-in-chief are Dr H P Kuemmerle, of Tubingen, and Dr P Rentchnick, of Geneva

Pharmacological Meeting in Stockholm —Under the auspices of the Section on Pharmacology of the International Union of Physiological Sciences, the first International Pharmacological Meeting will be held Aug 22-25, 1961, in Stockholm, Sweden The scientific program will be centered on topics which come under the general heading of 'Mode of Action of Drugs" Introductory lectures will be given in English, and it is suggested that all communications submitted to the meeting be presented in English It is further suggested that American authors use the international standards only Facilities for the projection of motion pictures will be available Abstracts of proposed papers must reach the Secretariat, First International Pharmacological Meeting, Karolinska Institutet, Stockholm 60, Sweden, not later than March 1, 1961. Exhibits are planned. The meeting is arranged to include the following symposia:

I. Pharmacological Control of Release of Hormones including Antidiabetic Drugs
II. Effects of Drugs on Synthesis and Mobilization of Lipids
III. New Aspects of Cardiac Glycosides
IV. Drugs and Membranes
V. Methods for the Study of Pharmacological Effects at Cellular and Subcellular Levels
VI. Metabolic Factors Controlling Duration of Drug Action
VII. Modern Concepts in Relationships between Structure and Biological Activity
VIII. Pharmacological Analysis of Central Nervous Action

For information, write the Secretariat at the above address.

CORRECTIONS

Barbiturate Coma.—In the comment with this title in the Questions and Answers section of The Journal (Oct. 1, p. 554,), in the tenth line, the word pyridinecarboxamide is misspelled.

International Symposium on Myocardial Infarction to Be Held in 1961.—Dr. Thomas N. James, of Detroit, has written, "On page 54 of the October 1 issue of the JAMA there is an erroneous announcement stating that our International Symposium entitled 'The Etiology of Myocardial Infarction' will be held in November of 1960. The symposium is scheduled for Nov. 16-18, 1961. . . ." The symposium will be held at the Henry Ford Hospital, Detroit.

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Written.* Various locations, June 30. *Oral.* Kansas City, Apr. 17-22. Sec., Dr. Forrest E. Leffingwell, 217 Farmington Ave., Hartford 5, Conn.

American Board of Dermatology: Final date for filing applications of candidates completing training by October 15, 1960 is March 1, 1961. *Written.* Several cities, June 5, 1961. *Oral.* Philadelphia, Oct. 13-16, 1961. Sec., Dr. Maurice J. Costello, One Haven Avenue, New York 32, New York.

American Board of Internal Medicine: Schedule for 1961: *Written Examination.* October 16. *Oral Examinations.* New Orleans, Jan. 30-Feb. 2; Chicago, April 4-7; Los Angeles, Sept. 26-29; New York City, Nov. 7-10. Closing date for acceptance of applications for the January and April examinations was October 1, 1960, and for the September and November examinations is June 1, 1961. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Obstetrics and Gynecology: *Written.* Various cities of the United States, Canada, and military centers outside of continental United States, January 13. *Oral.* Chicago, Apr. 7-14. Application for certification, new and reopened in Part I, and requests for reexamination in Part II are now being accepted. Deadline for receipt of applications for the written examination was August 1. Candidates submitting applications in 1960 for the 1961 examinations are not required to submit case reports as previously required to complete the Part I examination. In lieu of this requirement, new candidates are required to keep in their files a duplicate list of hospital admissions as submitted with their application, for submittal at the annual meeting in Chicago should they become eligible to take the Part II (oral) examination. Reopened candidates will be required to submit case reports for review thirty days after notification of eligibility. Exec. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written.* Jan. 23. *Oral.* Chicago, Oct. 2-6. Final date for filing application was July 1, 1960. *Written Examination,* Jan. 22, 1962. Final date for filing application is July 1, 1961. Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

American Board of Orthopaedic Surgery: *Written and Oral, Part I.* Palo Alto, Calif., Nashville, Tenn., Philadelphia, June 19-20. Final date for filing application is Jan. 1. *Written and Oral, Part II.* Miami Beach, Jan. 4-6. Final date for filing application was July 1. Sec., Dr. Sam W. Banks, 29 E. Madison St., Chicago 2.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 2-6. Final date for filing application is March 31. Sec. Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pediatrics: *Written.* New York City, January. Final date for filing application is Dec. 1. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Physical Medicine: *Parts I and II.* New York City, June 24-25. Final date for filing application is Feb. 15. Sec., Dr. Earl C. Elkins, 102 Second Ave., S. W., Rochester, Minn.

American Board of Plastic Surgery: Entire examination—*written,* and *oral* and *practical* given in May of each year. Final date for submitting case reports is January 1. Next examination to be given in New York City, May 14-16. Corres. Sec., Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8, Mo.

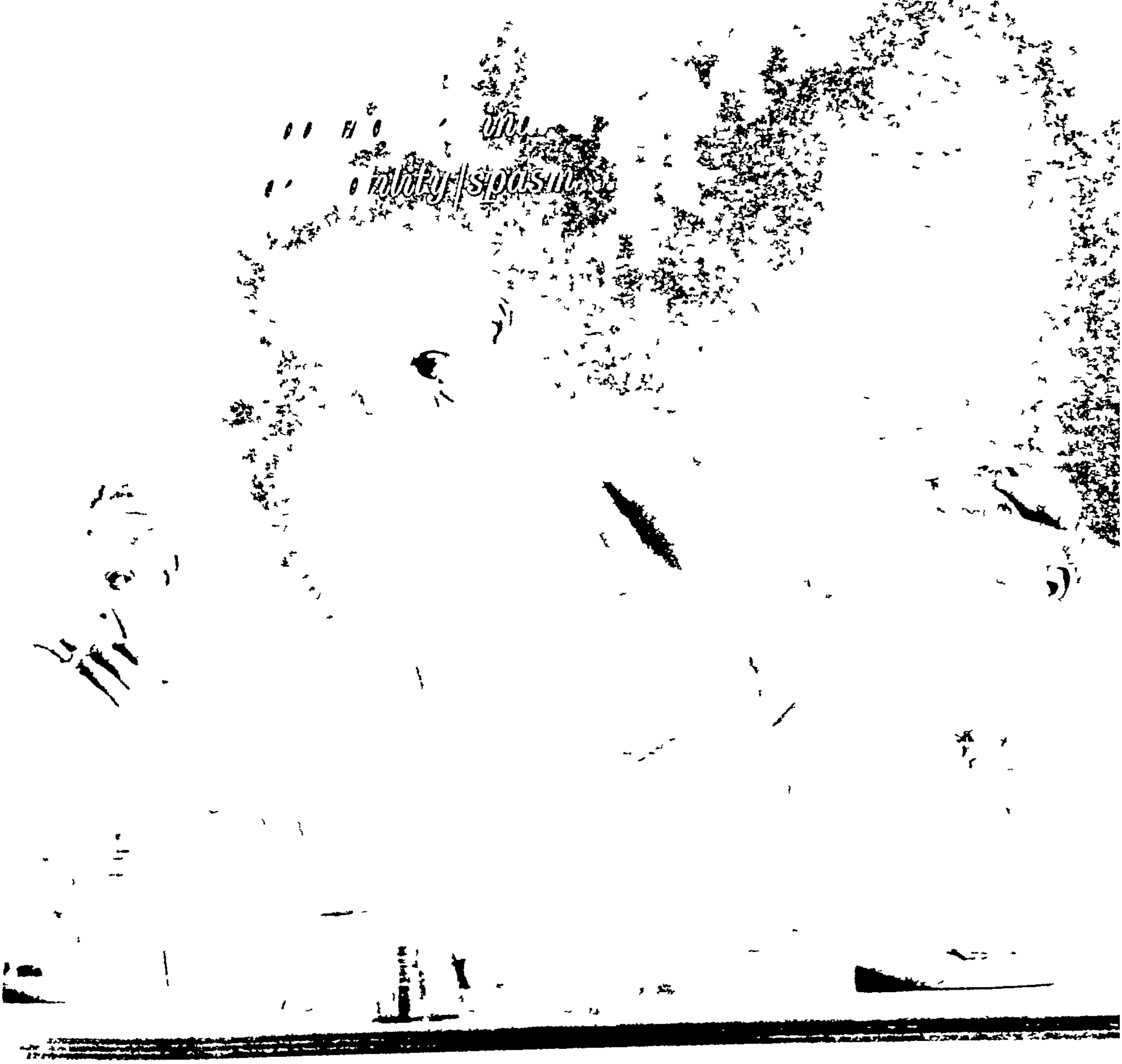
American Board of *Psychiatry and Neurology:* New York, New York, Dec. 12-13; New Orleans, Mar. 20-21 and Chicago, Oct. 9-10, 1961. Sec., David A. Boyd, Jr., 102-110 Second Ave., S. W., Rochester, Minn.

American Board of Radiology: *Examination.* Cincinnati, Dec. 10-13. Deadline for filing applications for the June examination was Jan. 1. Filing deadline for the December examination was July 1. A special examination in Nuclear Medicine (for those diplomates in Radiology or Therapeutic Radiology) will be offered provided there are sufficient applications. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: *Written* (Part I). Various Centers, Dec. 7. *Candidates are urged to apply several months before completion of training requirements.* The closing date for filing applications was August 1. Those completing training requirements after September 30 cannot be considered for the December Part I examination of the same year. *Oral* (Part II)—Nashville, Dec. 12-13; Philadelphia, Jan. 16-17; Houston, Feb. 13-14; Columbus, Ohio, Mar. 13-14; New York City, April 19-20; Portland, Ore., May 15-16; San Francisco, May 18-19. Sec.-Treas., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: *Written.* Various centers throughout the country, Feb. 10. Final date for filing application is Dec. 1. *Oral.* April 1961. Final date for filing application is Dec. 1.

American Board of Urology: *Written.* December. *Oral Clinical.* Chicago, February 1961. Exec. Sec., Mrs. Ruby L. Griggs, 30 Westwood Road, Minneapolis 26.



prolonged relief of gastrointestinal hypermotility/spasm

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superior antispasmodic-anticholinergic action
sustained action plus flexibility of dosage

" Belladenal Spacetabs have a strong anticholinergic and central sedative action The incidence of side effects was so low as to be negligible The disintegration time is so timed that one tablet provides a therapeutic effect lasting ten to 12 hours "

Kadish A H Am Pract & Digest Treat 7:2006 Dec 1956

BELLADENAL SPACETABS

Bellafoline* 0.25 mg phenobarbital 50 mg
Adults 1 in the morning and 1 in the evening

BELLADENAL TABLETS

Bellafoline* 0.25 mg phenobarbital 50 mg
Adults 2 to 4 tablets per day (May be given in ½ or ¼ tablet portions every several hours)

* LLADON A M LATES.

BELLADENAL ELIXIR

Bellafoline* 0.078 mg phenobarbital 15.6 mg per 5-cc teaspoon.
Adults 1 to 2 teaspoonfuls every 2 to 4 hours
(Total daily 2 to 4 tablespoonfuls)
Children ¼ to 1 teaspoonful 3 to 4 times per day

BELLADENAL SUPPOSITORIES

Bellafoline* 0.5 mg., phenobarbital 100 mg
Adults 1 to 2 daily

SANDOZ

the literature, and 13 additional cases have been reported to me in personal communications, making a total of 95 All but one of these were in adults, the youngest patient being 8 years old (and the next 23) and the oldest 75, the great majority, 64%, being between 40 and 60 years of age Men predominated over women in a ratio of more than two to one

Preliminary review of these cases made it evident that, although the essential feature of them all was ureteral obstruction associated with retroperitoneal fibrosis, they fell into two distinct groups (1) a group in which the fibrosis was symmetrical, involving both ureters, coincidentally or in succession, and for which no probable connection with pre-existing or co-existing inflammation could be found, and (2) a group in which the fibrosis seemed more localized and for which a causal connection with pre-existing or co-existing tumor or inflammation was evident or probable It has seemed best to include in this group all in which only one ureter was involved, though probably some of these belong in the first group Indeed, it is possible that all should be considered together There may well be some difference of opinion on this point

However, it has seemed best, for purposes of analysis, to eliminate all in the second group and, in addition, some cases probably belonging in the first group but in which insufficient data were available for analysis This left 64 cases for which the term "idiopathic" retroperitoneal fibrosis seemed clearly justified, using the word "idiopathic" in the same sense as we formerly used the term "essential" in essential hematuria In analyzing this series it is a handicap that in many instances the attention of the reporter was focused on identifying the lesion and on the treatment, so that the events and symptoms leading up to the evident involvement of the urinary tract were often passed over

The subject will be discussed here under three headings (1) Pathology and Etiology, (2) Symptoms, Findings and Diagnosis, and (3) Treatment and Results As introduction, synopses of the two cases reported in 1948[1] are here inserted, because they are typical One illustrates the undiagnosed condition with its unfortunate result, and the other is an instance of early recognition and treatment

Report of Cases

Case 1—This 45-year-old man was first seen in June, 1942, complaining of substernal pain, low backache of four months duration, radiating down both thighs, and loss of 10 lb (4 5 kg) in weight in the past five months History and physical examination showed nothing unusual Urine showed no albumin, pus, or red blood cells The hemoglobin level was 10 8 Gm , with 5,800 leukocytes Results of a Wassermann test were negative Complete gastrointestinal examination and orthopedic examination showed no abnormalities

A few days later he was admitted with complete sudden, unheralded anuria of 10 days duration, vomiting, and with a non-protein nitrogen (NPN) level of 110 per cent Cystoscopy showed a normal bladder, there was no difficulty in catheterizing the ureters, and clear urine was found in both pelves Pyelograms were interpreted as showing slight dilatation of the left pelvis only As long as the catheters were left in place there was free flow of urine, but on removal there was again anuria In the next two weeks, successive nephrostomies were performed The wounds closed and the patient was sent home in October, 1942, voiding normally but with urinary infection and with persistent anemia During the next three years he was in and out of the hospital At first the nephrostomy wounds opened occasionally, but after March, 1943, they remained closed His ureters were frequently dilated with bulbs 8 and 10, the urine remained infected, the renal function diminished and the anemia persisted

In the summer of 1945 he was given penicillin treatment and transfusions, but his downhill course continued, and in February, 1946, he died in the hospital

Autopsy showed a fibrous retroperitoneal mass covering the promontory of the sacrum and extending up to the kidney The ureters, which were *structurally normal and showed no strictures*, ran through the lateral margins of this mass, and were enveloped and compressed by it, but not invaded The kidneys were completely destroyed by infection and back pressure I quote from the autopsy report

> The retroperitoneal tissues surrounding the aorta and extending from the kidneys to below the sacral promontory show almost complete replacement with a dense, grayish white fibrous connective tissue mat This tissue is 2 cm in thickness at its thickest point and extends out to and including the ureters The ureters, aorta and vena cava all traverse this dense mass of fibrous tissue which is sufficient to nearly occlude the lumina of the ureters
>
> Sections of this dense fibrous mass reveal that it is composed entirely of extremely dense bundles of collagen This tissue is poorly nucleated, but the cells, where seen, are of typical fibrous connective tissue type This fibrous connective tissue surrounds without invading the large vessels, lymph nodes, nerves and ureters
>
> Sections at the edge of this area of fibrosis reveal a rather sharp demarcation, but absolutely no evidence of encapsulation The cells composing this area of fibrosis are all extremely small and show no evidence of malignancy In one portion the fibrous tissue is invading the surrounding skeletal muscle, which shows, as previously surrounded muscle is examined, a gradual atrophy and disappearance This fibrous tissue has no sign of malignant characteristics and has rather the appearance of a keloid

Case 2—This 43-year-old man was first seen in the urological department of the Henry Ford Hospital in January, 1946 He had previously been treated by various divisions of the hospital for 22 years He seemed susceptible to upper respiratory infections and some years earlier had an appendectomy with wound infection, which was slow in cleaning He had had an attack of bacillary dysentery at one time and was continuously slightly anemic At no time had the urine shown any abnormality

He had had low backache for a few months which radiated to his testes When first seen in urology, the urine was clear, the backache very severe, hemoglobin 11 Gm , kidney, ureter, and bladder, barium enema, and chest x-ray normal

The backache was severe enough that an iophendylate (Pantopaque) myelogram was made, followed by laminectomy The backache was somewhat relieved, but anemia and asthenia persisted and there was no gain in weight On March 25, 1946, there was complete, sudden, and unheralded anuria Examination revealed no renal masses or tenderness Cystoscopy showed a normal bladder, the ureters were easily catheterized, with clear urine in both pelves Pyelogram showed only slight dilatation of the left pelvis

As long as the catheters were in place there was a constant drip, but, on their removal, the anuria recurred and it was necessary to reintroduce them

Because of the patient's anemia and the puzzling character of his course in the past, it was suspected that the ureters might be involved in some malignant process, and the decision was made to explore the abdomen

On April 4, 1946, a right paramedian, lower abdominal incision was made The peritoneal surfaces were smooth, the kidneys felt normal, the liver was not enlarged, and no nodules were felt on its surface The gallbladder had been previously removed and there were numerous adhesions in this region A retroperitoneal, flat mass with indistinct lateral margins was felt covering the promontory of the sacrum A bit of this was removed for biopsy and frozen section showed it to be inflammatory in nature I quote from the pathological report

> Sections of the retroperitoneal tissue reveal alternating areas of dense fibrous, connective tissue and fat Throughout the entire sections examined is a diffuse infiltration of small round and wandering cells occasional eosinophils and polymorphonuclear leukocytes In some instances the lymphatic cells are collected into small follicles Considerable fibroblastic activity is seen but no abscesses are present and there is no evidence of a specific etiology There is no microscopic evidence of neoplastic process

The ureters were located below this mass, traced up, and found to pass through this tissue near its lateral margins Both ureters were dissected entirely free from enveloping tissue and seemed entirely normal They were left free in the abdominal cavity, no attempt being made to cover them with peritoneum The ureteral catheters were removed in the next two days Wound healing and convalescence were uneventful, and there has been free and normal urination ever since The patient was given deep x-ray therapy directed at the inflammatory mass described above His course was followed carefully, and in the succeeding years he had no impairment of renal function and no symptoms or findings referable to the urinary tract He was able to care for his wife through some years of invalidism and as of this writing is in reasonably good health It seems highly probable that, had he received the same treatment when he had his first attack of anuria, patient no 1 would have had a different result

Pathology and Etiology

Among these 64 reported cases there were 10 deaths and 5 autopsies (Hackett's Case 1, Hutch's Case 1, my Case 1 Raper's Case 7, and Steuber's Case 8) The nature of the condition was discovered at operation in the other cases The autopsy descriptions and the operative descriptions agree very well, and as there were biopsies obtained at almost all the operations, we have plenty of microscopic descriptions of the tissue

In every case there was a fibrous mass or plaque 2 to 6 cm thick lying in the retroperitoneal tissues over the promontory of the sacrum, extending laterally to the ureters, upward for varying distances (only once beyond the lower pole of the kidney), and downward to the upper border of the pelvis (in only one case down into the pelvis) This sheet was sharply delimited but was not encapsulated, it enveloped the retroperitoneal structures but did not invade them, and the posterior peritoneum, though not invaded was adherent to it The inflammatory process did, at times, invade the adjacent muscles, which may be of significance in view of some of the symptoms to be described later

The microscopic descriptions of the tissues whether obtained at autopsy or by biopsy, were very similar There was fat in varying amounts, fibrous tissue, described as collagenous or cartilaginous or hyaline, sometimes in whorls, with infiltration by wandering and mononuclear cells and eosinophils in different degrees Neutrophils were found, and, in some, collections of lymphocytes were described In only one case, Miller's,[11] were abscesses found

Any differences which existed in the microscopic appearances consisted in the relative amount of fat, the types of fibrous tissue, and the cellular infiltration For example, in my Case 1, in which there is good reason to believe the involvement of the ureters had been present for four years, the tissue was dense, almost without fat, and with very little cellular infiltration But in another (my Case 2), in which the ureters had only begun to show involvement and the process was evidently younger and of much shorter duration, the tissue was looser and there was considerable fat and infiltration of wandering cells, occasional eosinophils, and polymorphonuclear cells, and, in some places, collections of lymphocytes resembling follicles

In coordinating the case histories and the microscopic descriptions of the tissues after the biopsies, *in general*, the longer the duration of the process the less fat and the fewer inflammatory cells were seen, whereas, in younger or more acute instances both seemed more prominent This was not consistent, however, and the relationship could not be depended on, particularly as it was often difficult to estimate the duration of the process from the data at hand Abscesses were found only once, though collections of lymphocytes were frequent In only a very few instances were cultures of the tissue made, some showing no growth, others growth of *Proteus* or *Escherichia coli*

The impression is given of a slowly progressive inflammation, originating about the great vessels and spreading laterally, enveloping, but rarely invading, the retroperitoneal structures as it spreads, healing and contracting even as it spreads Of the retroperitoneal structures, the ureters are particularly vulnerable Arteries and nerves are sturdy structures, not nearly as compressible as veins and ureters Compression of veins, if not too rapid, is compensated for by the collateral circulation, and there need be no evidence of such compression, but there is no compensatory drainage of urine, and compression of the ureters is bound to affect the kidneys Hence, in all the cases reported its presence has been brought to light by its effect on the kidneys

In the few instances where the ureteral wall was found to be degenerated, this could easily be explained by pressure and ischemia and was not necessarily due to invasion In one instance the vena caval wall was described as involved in the inflammatory process, in another case (personal communication by Urwiller) the patient consulted the surgeon because of the effects of obstruction to the iliac artery on one side At operation, there was found an unsuspected hydronephrosis with complete renal destruction, necessitating nephrectomy The hydronephrosis was due to encasement of the ureter in a fibrous mass, which had also involved the iliac artery to such an extent that it was considered undesirable to interfere with it Later the other ureter became enmeshed by the fibrosis and ureterolysis was successfully performed

The para-aortic lymph glands were mentioned only three times—once as unchanged, once as distorted, and once as containing hemosiderin

One fact was very clear the process was limited by the extent of the perirenal or Gerota's fascia In only one case did it extend beyond the walls of the fascia, and *in only one* did *it* completely fill the fascial compartment Hutch and collaborators,[7] in a splendid paper, recently have shown this clearly and have advanced the theory that the condition is a fascitis, and prefer to call it perirenal fascitis Whether it is an inflammation *of* the fascia or is an inflammation contained *by* the fascia is of small consequence, determining its cause is no nearer to solution

Recently Hewett and Headstream[12] have reported a case of pericystic fibrosis in which the fibrotic mass filled the pelvis This may or may not be related to the conditions being considered here

Various suggestions have been made as to the cause of this fibrosis The urinary tract, I believe, can be definitely ruled out It is true that there are reports of periureteral fibrosis clearly resulting from urinary infection, like those reported by Vest,[13] but in these the pathological picture was different from what is being considered here, and they are not included in this paper A large proportion of the patients included here under the classification of "Idiopathic Retroperitoneal Fibrosis" had no history of urinary tract infection, either past or present, and in most of those in which infection was present it was evidently secondary to the obstruction

Organizing hematoma due to hemorrhage, trauma, or other condition has been advanced as a cause Hemorrhage with hematoma formation can occur anywhere in the body, and a good deal is known about the fate of such Hematomata may be absorbed, if infected they may become cystic and surrounded by a fibrous capsule, and they have a tendency toward calcification Their pattern does not resemble the pattern of the fibrosis considered here Moreover, with the exception of previous abdominal surgery, in only one instance was there a clear history of external trauma, and that had occurred many years before

Raper[8, 9] favors a vascular origin, and in several instances the finding of perivascular collections of inflammatory cells may be significant There is recorded one case associated with periarteritis nodosa

It has been suggested that it is significant that none of these cases occurred before the antibiotic era and that infections only partially controlled by antibiotics may play a role I am not in a position to estimate all the effects of antibiotics, but I surely cannot attribute all the occurrences of the past 20 years to them

The lymphatic system, and the para-aortic nodes, which are enclosed in the perirenal fascial compartments inevitably come under suspicion We know that they drain the pelvic organs, genitalia, lower extremities, and the mesenteric lymph nodes, and that infections, viral as well as bacterial, even if manifest in the upper respiratory tract, may involve the whole lymphatic system, and all are familiar with the abdominal symptoms that can be caused by "intestinal flu," or by mesenteric lymphadenitis in children

Enlargement of lymph glands from foci of infection is common In acute lymphadenitis the nodes are swollen and tender, and in chronic lymphadenitis various degrees of fibrosis may result The fibrosis about metastatic carcinomas resembles an allergic reaction, and such fibrosis may be widespread This might also be true of the fibrosis about the nodes resulting from their inflammation

Unfortunately, we have very little data on the condition of the glands, and such as we have does not support the theory of lymphatic origin On the other hand, there is not enough evidence to eliminate the theory of glandular origin More evidence is needed, and as time goes on there will undoubtedly be more autopsies It is to be hoped that more generous biopsies will be taken, especially from the midline region

Ileitis has been mentioned as a possible cause, because it is often difficult to detect and could easily be overlooked It certainly could be overlooked in retroperitoneal operations, but there have been a large number of transperitoneal operations in which it was not found, nor was it found in any of the autopsies So, though ileitis undoubtedly can cause periureteral fibrosis, and there are several reports of the relationship of ileitis to ureteral obstruction, it can definitely be ruled out as the cause of idiopathic fibrosis considered here

Frank Hinman Jr has recently redirected attention to the phenomenon connected with temporary ureteral obstruction In intravenous pyelograms there is at times a diffuse extravasation of the medium about the pelvis and upper ureter, apparently associated only with obstruction, usually by stone He has suggested the possibility of urine so extravasated giving rise to a foreign body reaction and thus to a fibrosis If this did occur it might give rise to a localized periureteral fibrosis, but it does not seem likely that this phenomenon plays any role in the etiology of idiopathic retroperitoneal fibrosis

Trevor[15] believes that tumor of some sort is probably the initiating factor in retroperitoneal fibrosis, and it is a fact of common experience that malignant tissue can stimulate inflammatory reaction, although in some cases repeated biopsies may fail to demonstrate the underlying malignant condition In this series, in the few patients on whom autopsy was performed no carcinoma was found and in the remainder survival over a period long enough to preclude cancer has occurred in a large number of instances

As an example, my Case 2 has never had any further trouble, is still living 13 years later, and was able to care for his wife through years of disability, until her recent death This does not mean that some of these patients may not eventually show up with malignant disease, many were followed up for only a few months But this would only mean the elimination of those individuals from this classification

Tuberculosis, lues, and brucellosis have been mentioned as possibilities In the few instances in which tests for these were reported they were ruled out

The etiology of this process therefore remains obscure, but it seems reasonable to postulate an infectious source, probably at a distance, transported through the lymphatic or vascular system

In this connection it may be of interest to mention other fibrotic processes of doubtful origin Mediastinal fibrosis[17] in which the etiology is as puzzling as that of retroperitoneal fibrosis, has been reported frequently in the past few years, and there is one report of a patient with coincidental mediastinal and retroperitoneal fibrosis

Riedel's struma, otherwise known as chronic ligneous thyroiditis, is also a mystery Crile described it as "a diffuse fibrosis of the neck with the thyroid in the center" In this there is never any involvement of the lymph glands

Sarcoidosis is a protean disease and tends to affect the lymphohematopoietic organs It seems to be occurring more frequently, and more and more obscure conditions are being labelled sarcoiditis The National Research Council in 1948 gave the following description "Sarcoidosis is a disease of unknown etiology Pathologically it is characterized by the presence in any organ or tissue, of epithelial cell tubercles with inconspicuous or absent necrosis, and by the frequent presence of refractile or apparently calcified bodies in the giant cells of the tubercles *The characteristic lesion may be replaced by fibrosis, hyalinization, or by both* '

In Dupuytren's contracture of the palmer fascia, there is a thick, firm, confluent mass of fibrous tissue with foci of lymphocytic infiltration, in the palm of the hand, adherent to the skin, but not involving primarily the tendons, tendon sheaths, or joints The etiology is unknown

Peyronie's disease consists of plastic induration of the corpora cavernosa of the penis It is composed of dense white fibrous tissue in the form of a plaque The etiology is unknown

In all these the final result is fibrosis and in all the etiology is unknown

Symptoms, Findings, and Diagnosis

Between them, my Cases 1 and 2 list most of the important symptoms that have been reported One finding, the importance of which will be brought out later, was not made in these two cases, namely, medial deviation of the midureters It was probably present but was either missed or its significance was not realized

Diagnostic procedures consist of

1 The usual history and physical examination, including the usual laboratory procedures
2 Intravenous urography
3 Cystoscopy, ureteral catheterization, and retrograde pyelography Procedures 1, 2, and 3 are indispensable
4 Gastrointestinal examination, not commonly necessary or advisable
5 Arteriography or cavography, rarely, and
6 Presacral insufflation with carbon dioxide, very rarely

1 History and Physical Examination (Including Symptoms for Which to Be Alert)—The symptoms which have most often been reported are low backache, lumbar and costovertebral backache, flank pain, inguinal or lower quadrant pain, lateral abdominal pain, sometimes radiation of pain to the inner aspects of the thighs, and occasionally to the testes, attacks of nausea and vomiting, anorexia, weight loss, asthenia, pyuria, urinary frequency, oliguria, and anuria Anuria, signifying complete occlusion of both ureters, is the most significant of all presenting symptoms It occurred frequently

The routine physical examination may show very little, or renal tenderness may be found on one or both sides, or palpable masses may be present in the flanks In only four instances were the fibrous masses palpated Possibly in others they might have been detected had they been suspected, though most of them were not massive enough to be readily palpated through the abdominal wall, and none were tender Some lateral abdominal tenderness may be noted In the typical case, examinations of the genitalia and rectum are helpful only in ruling out pathological conditions The temperature has usually not been remarkable and the blood pressure, whether high or normal, seemed to be of no significance, though in a few instances hypertension associated with renal insufficiency was benefited by restoration of renal function

Routine urinalyses in a surprising number of cases showed no pus, blood, or albumin In some the only possibly significant finding was of a few red blood cells in the sediment, considered of little consequence

Routine blood counts have shown a moderate grade of anemia in a surprisingly large proportion of the cases, even in early ones without infection or nitrogen retention The number of leukocytes tends to be slightly elevated, though usually not strikingly so, and the differential count and the sedimentation rate, when obtained, showed nothing notable Nitrogen retention was present when there was advanced bilateral renal damage Popham and Stevenson recently reported the finding of a coagulation defect (Factor VII deficiency) in a patient with a pelvic retroperitoneal fibrosis, somewhat resembling that reported by Hewett and Headstream and of a type specifically excluded from this consideration

In assaying these symptoms and physical findings, it is difficult to separate one from another—those attributable to the unknown etiologic factor which preceded the production of the fibrosis, those caused by the fibrosis per se, and the secondary symptoms arising from the tissues or structures affected by the fibrosis

The structure which is the last to be enveloped and the one which invariably gives rise to symptoms when involved is the ureter Gradual obstruction of the ureter causes increasing hydronephrosis, complicated often by infection of the retained urine, and progresses toward complete destruction of the kidney If the condition is, or becomes, bilateral, uremia results Closure of the ureters often caused anuria, and many patients came to physicians with that symptom Those were fortunate whose first symptom was unheralded anuria caused by sudden complete obstruction of both ureters before severe damage had been done to renal function (Case 2) In some instances there was a period of oliguria culminating in anuria, often late in the course of events

Symptoms associated with uninfected hydronephrosis are lumbar, renal, and flank pain and tenderness, associated often with a palpable mass in the flank If infection occurs, febrile attacks, pyuria, and urinary frequency and burning may be present Renal insufficiency and uremia, of course, are often accompanied by anorexia, nausea, and vomiting and weight loss

The symptoms which brought patients to the physician were nearly always traceable to the urinary tract, but in *enough cases to be significant* there is a record or history of a period preceding the onset of urinary tract symptoms, characterized by all or some of the following complaints low backache (and this is probably the most characteristic and may be very severe), abdominal and flank pain, often radiating to the inguinal regions and the inner aspects of the thighs, and occasionally the testes, attacks of nausea and vomiting, anorexia, weight loss (frequent and often marked), and asthenia During this period there may be no evidence of urinary tract involvement, the physical findings may be negligible, the urine may show an occasional red blood cell, the blood, almost always, shows a moderate anemia, leukocytosis may be absent or not remarkable, and temperature may not be elevated

It seems reasonable to suppose that the fibrosis itself, or its cause, may be responsible for these symptoms, either per se, or because of its effect on retroperitoneal structures other than the ureter, as they become involved, such as arteries, veins, and nerves and their plexuses

Increased awareness that such symptoms may be caused by retroperitoneal fibrosis should result in the recognition of the cause of some puzzling dilatations of the upper ureter and pelves early enough to forestall severe renal damage Moreover, it is possible that some patients complaining of apparently causeless abdominal symptoms or troublesome low backache may be found to be victims of this condition There is one report, Lund,[16] of the diagnosis of retroperitoneal fibrosis being made in the absence of evidence of involvement of the urinary tract Treatment was with phenylbutazone (Butazolidin) and was apparently successful at the end of three months, but there had been no biopsy and the diagnosis is therefore open to question

2 *Intravenous Urography*—When feasible, intravenous urography is indispensable Bilateral

hydronephrosis, unilateral hydronephrosis, unilateral absence of function may be found The most important findings are dilatation of the upper ureter and pelvis, with narrowing or obliteration of the midureter and with deviation of that part of the ureter medially, as if contraction of the fibrous mass had taken place after the ureter had been enveloped Sometimes it makes almost a right-angle bend to the ureter This medial deviation is very suggestive when present and is probably the most important x-ray finding

3 *Cystoscopy, Ureteral Catheterization, and Retrograde Pyelography* —Cystoscopy is indispensable, and the findings should be correlated with those of intravenous urography The same dilatation of the pelvis and upper ureter and the same deviation of the ureter may be found, and in addition the amount of residual urine in the pelves and the presence or absence of infection can be determined Ureteral catheterization can usually be accomplished, but often meets difficulties in the region of the fibrotic envelopment and occasionally has been impossible

4 *Gastrointestinal Examination* —Gastrointestinal examination is not usual, but in selected cases may be desirable if ileitis, regional enteritis, or diverticulitis are suggested In several instances it was reported that gastrointestinal series had shown normal appearances

5 *Arteriography or Cavography* —Arteriography or cavography are almost never indicated But in one instance (personally communicated) arteriography was the determining factor in bringing the patient to operation, and in another cavography gave information of some importance

6 *Presacral Insufflation with Carbon Dioxide* —Presacral insufflation[14] of carbon dioxide has not been reported It could conceivably be of value The fibrosis would probably form an impassible barrier to the diffusion of the gas upward, or even if there were a small lateral open passage there would still probably be a filling defect at the site of the plaque If the whole retroperitoneal space filled with the gas it would probably rule out the possibility of this fibrosis

The final diagnosis has to be made at operation, when the differential diagnosis has to be made between this type of fibrosis, periureteritis, intrinsic ureteral stricture, primary malignant disease of the ureter, kidney, or retroperitoneal region, intraperitoneal inflammation and malignancy, metastatic malignant disease, endometriosis, and the results of trauma Usually exploration of the ureter left little doubt (Case 1 is a good example of the true condition being missed because the exploration at the time of operation did not include enough of the ureter) Generous and well placed biopsies are desirable

The biopsy should be deep and should be from more than one area of the plaque Even so, mistakes will occur Primary retroperitoneal tumor, or metastatic tumor from the breast, pelvic organs, or prostate must always be kept in mind In a patient seen recently by me, exploration and biopsies showed only fibrous tissue enveloping the ureter Nephrostomies were performed and a probable diagnosis of idiopathic retroperitoneal fibrosis was made, only to have the patient's condition deteriorate until death occurred Autopsy showed an undiagnosed carcinoma of the prostate, with metastases causing the fibrosis Only autopsy or passage of time can rule out completely the possibility of tumor

Treatment and Results

Treatment must be aimed primarily at the urinary tract, to relieve obstruction, restore renal function as far as possible, and to combat infection Success has been in proportion to the promptitude with which treatment is undertaken after damage to the urinary tract has commenced and in inverse proportion to the amount of damage which has already taken place Those treated early could be restored practically to normal, but severe damage is irreparable, and those in the advanced stages of uremia and infection, while relieved, were left with crippled renal function In between the extremes results varied, depending on the amount of restoration possible in at least one kidney

The favored treatment has been ureterolysis, often combined with nephrostomy or ureterostomy and sometimes with plastic surgery of the ureter, where a portion of it was so altered by ischemia as to necessitate resection It is best to take some measures to prevent reinvestment of the ureter with the fibrous process leaving it free in the peritoneal cavity, closing the dissected channel, or filling it with fat and, at the same time, transplanting the ureter away from its former course In most of these patients one side was treated first and the other later The advantage of intraperitoneal or transperitoneal operation is that both sides can be inspected and treated simultaneously As this condition becomes more generally recognized preoperatively, more can be treated in this way It has the difficulty, however, that ureteroplasty or nephrostomy, if desirable, are made more difficult

So far, treatment to the fibrotic process itself has been rather blind and the results are indefinite Deep x-ray and various preparations of cortisone have been used, as well as the antibiotics In one instance,[16] phenylbutazone was used Usually the results have been satisfactory, for no evidence has been recorded of further progress of the plaque so far as symptoms are concerned, but whether it has remained unchanged in situ or whether it has receded is unknown One case (Shaheen's Case 2)[18] is on record in which recurrence of ureteral involvement with symptoms after bilateral ureterolysis was successfully treated with cortisone On the other hand, there is one instance on record of ureteral involvement occurring while the patient was being treated with cortisone

There is one case reported in which no treatment was given to the urinary tract, all treatment being directed at the fibrosis, and with a satisfactory result In this case, after abdominal exploration had shown the ureter encased in the fibrous envelope, the wound was closed and the patient given antibiotics, with apparently good results, though the follow-up was short

Probably, as the years pass, there will be autopsies on some of the former victims of this lesion which will provide the information desired In the meantime it seems reasonable to treat these patients with some form of cortisone and with antibiotics

Summary and Conclusions

The results of treatment of 64 cases of so-called "idiopathic" retroperitoneal fibrosis have been reviewed The pathology, etiology, symptomatology, findings, and diagnosis of other clinical conditions showing similarities to this have been discussed

The results reveal a picture of a low grade, more or less chronic inflammatory process of some kind, originating or settling in the region of the great vessels, causing a fibrosis which as it spreads and heals envelops the retroperitoneal structures giving rise to symptoms by irritation or compression Since the ureter is most vulnerable to this, progressive damage to the kidneys results, urgently requiring treatment

The following questions arise Can this condition be recognized before it affects the ureters? Is it possible that the spread of the inflammation may be brought to a halt before it involves the ureters? May this lesion not explain some of the puzzling, so-called functional cases of abdominal pain or low back pain or some obscure circulatory disturbances of the lower extremities? If the diagnosis involves subjecting the patient to complete gastrointestinal investigation, arteriography, and presacral insufflation of carbon dioxide, would it be worthwhile in the absence of the knowledge of a reasonably dependable form of treatment? Possibly in some of these obscure cases, *in the presence of weight loss and anemia* the effect of cortisone and antibiotics might be tried

My conclusions are as follows

1 "Idiopathic" retroperitoneal fibrosis is a definite clinical entity, though its etiology has not been determined
2 It is not primarily a urologic condition
3 It has almost invariably manifested its presence by its effect on the urinary tract, and has therefore been usually a urologic problem
4 After the ureter has become involved, early diagnosis and treatment are urgent
5 There is a series of symptoms often preceding the onset of urinary tract symptoms, which may arise from the fibrosis itself or its preceding cause, which may conceivably place the early stages of it in the field of the internist

In closing, I should like to quote from an unsigned editorial in the *Lancet* of Oct 19, 1957

> Many a clinical reputation lies behind the peritoneum In this hinterland of straggling mesenchyme with its vascular and nervous plexuses, its weird embryonic rests, its shadowy fascial boundaries, the clinician is often left with only his plan and his diagnostic first principles to aid him Nonspecific periureteric fibrosis is likely to tax them both
>
> At an early stage the symptoms usually point to a growing retroperitoneal lesion, but this limited diagnosis is rarely made Retroperitoneal pain can be severe and persistent enough to drive the most phlegmatic patient to distraction, but when there are no abdominal findings, his complaint is likely to be received with incredulity

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Ureteral Obstruction Due to Idiopathic Retroperitoneal Fibrosis

Report of One Case and Collective Review of Thirty-four Additional Cases

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Idiopathic retroperitoneal fibrosis causing ureteral obstruction is a relatively uncommon clinical entity The various etiological theories have not satisfied all cases Thirty-four previously recorded cases are here reviewed and a new case is added The disease is more common in males and usually bilateral It presents no characteristic clinical picture Diagnosis is suggested by urographic findings but confirmed only at surgical exploration Preoperative exclusion of other possible causes of ureteral obstruction is usually impossible In the present case, that of a 44 year old woman the ureter was dissected free and its function restored, after that the entire fibrotic mass was excised, although this has not generally been found possible or necessary Best results have been obtained by ureterolysis, preceded by nephrostomy in selected cases

A DISTINCT clinical entity characterized by retroperitoneal fibrosis of unknown etiology causing ureteral compression and obstruction has been described by various authors Since the first report by Ormond[1] in 1948, a total of 34 proved cases have been recorded in the literature (Table 1) We shall report one additional case and review those previously recorded in order to delineate the important clinical and therapeutic features of this unique and uncommon disease Cases of periureteritis plastica as described by Vest and Barelare[2] and of perirenal fascitis (Hutch and co-authors[3]) are not included, since these represent an anatomically separate, though perhaps related, entity

Report of a Case

The patient, a 44-year-old woman was admitted to the White Plains Hospital on March 10, 1956 complaining of left flank pain which radiated to her left lower quadrant and was associated with chills, nausea and vomiting On admission her vital signs were within normal limits except for a slight elevation of her temperature (100 2° F [37 9° C] rectally) On the next day this rose to 102 0° F (38 89° C) but never exceeded this level Some tenderness was elicited in the left flank, but no other abnormal signs were noted Neither kidney was palpable Urinalysis disclosed 8 to 10 leukocytes and 2 to 4 erythrocytes per high-power field, and urine culture was negative Her complete blood count was essentially normal except for a mild leukocytosis of 14,200 per cubic millimeter The blood urea nitrogen concentration was 11 mg % An intravenous pyelogram disclosed a normal right kidney and ureter The left kidney functioned promptly, but a moderate hydronephrosis and hydroureter extending down to within 8 cm of the bladder was evident, no medium was noted in this distal segment of ureter A roentgenogram of her chest was normal

The patient was started on daily parenteral administration of penicillin (400 000 U) and streptomycin (0 5 Gm) Cystoscopy was performed on March 15 1956 Elevation of the left bladder base with slight displacement of the left ureteral orifice by an extravesical mass was noted Examination was otherwise within normal limits A left retrograde pyelogram demonstrated marked narrowing of the distal 8 cm of the left ureter, with dilatation above this point Only one number 5 F catheter could be passed up the left ureter due to snugness at 8 cm This single catheter was left indwelling, anchored to an 18 F Foley catheter placed in the bladder Bimanual pelvic examination performed while the patient was anesthetized, permitted palpation of a flat, orange sized, firm, fixed mass overlying the sacral promontory, with evidence of extension of this mass to the left in the area of the bladder base and distal left ureter

In view of the above findings a tentative diagnosis of malignancy arising in either the rectosigmoid or the uterus —with extension as described—was entertained Sigmoidoscopy was promptly carried out and was negative On the next day a barium enema was also within normal limits Surgical exploration was then advised

On March 20, 1956 a preliminary dilatation and curettage of the uterus was carried out to determine primary uterine malignancy Frozen-section examination of this tissue failed to disclose evidence of neoplasm Exploration was then accomplished through a left rectus muscle-splitting

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From the departments of urology and surgery White Plains Hospital incision A hard, irregular mass could be palpated that extended from the sacral promontory and area of the great vessels at their bifurcation down to the area of the left bladder base and the lower lateral aspect of the uterus The ureter was noted to enter this mass superiorly approximately 8 cm above the level of its entry into the bladder Multiple biopsies of this firm mass demonstrated only fibrous tissue with no evidence of neoplasm By means of sharp dissection it was possible to follow the ureter through the fibrous mat and free it completely with a surrounding thin "cuff" of fibrous tissue The mass itself was then dissected from the bladder base and pelvic attachments other than the uterus as completely as possible and was removed en bloc with the uterus Total abdominal hysterectomy and left ovariectomy were carried out, because it was thought that the process was perhaps secondary to infection of the uterus or cervix Additional biopsies from the mass were submitted for frozen section and again demonstrated only fibrous tissue The freed ureteral segment was not opened but rather left lying free in its normal course after removal of the surgical specimen A routine appendectomy (done by K K N) completed the surgical procedure

Pathology—The specimen consisted of the uterus with attached left fallopian tube and ovary Extending superolaterally from the left side of the uterus was an irregular mass of dense rubbery tissue with ragged hemorrhagic margins The tissue was pale gray and tan-colored (#37410)

Microscopy—Sections through the mass of rubbery tissue disclosed numerous clusters of lymphocytes, phagocytes, and plasma cells in an enormously thick layer of rather loose fibrous tissue This fibrous tissue encircled many vessels as well as numerous nerve trunks Collars of chronic inflammatory cells often surrounded these vessels and nerves (see the Figure)

TABLE 1—Therapy and Follow up in Thirty five Cases of Idiopathic Retroperitoneal Fibrosis

	Patient				
Author and Yr	Age	Sex	Affected Side*	Therapy	Follow up
Ormond[1] (1948)	45	M	B	Bilateral nephrostostomy (temporary), ureteral dilatation	Died in uremia 4 yr P O[10]
	43	M	B	Bilateral ureterolysis X ray therapy	Well 11 yr P O
Anselem (1950)	23	F	B	Bilateral nephrostomy (temporary), rt nephrectomy lt ureterolysis	Good immediate result no late follow up
Ewell (1952)	49	M	B	Lt nephrectomy rt nephrostomy (temporary) with ureterolysis	Well 7 yr P O[10]
Miller (1952)	53	M	B	Biopsy only	Well 5 yr P O[10]
Bradfield (1953)	51	M	B	Lt nephrostomy (temporary), x ray therapy bil ureterolysis	Well 7 yr P O[10]
MacLean[8] (1954)	24	M	L	Lt ureterolysis	Well 5 yr P O
Chisholm & co authors[4] (1954)	36	M	B	Bilateral nephrostomy (temporary), bilateral ureterolysis	Well 4 yr P O[10]
Mirabile (1955)	34	F	B	Bilateral ureterolysis, secondary excision of lt ureteral stricture	9 mo P O rt kidney normal secondary diverticulum of lt ureter
Raper†[6] (1956)	25	F	B	Rt ureterolysis excision of ureteral segment with anastomosis on rt	Well 4 yr P O[10]
	45	M	B	Lt nephrostomy (temporary) with ureterolysis excision of ureteral segment with T tube anastomosis on rt	Well 3 yr P O[10]
	69	M	B	Biopsy (rt) only	No follow up
	53	F	B	Bilateral ureterolysis (after 2 yr delay)	4 mo P O nonfunctioning lt kidney, hydronephrotic rt kidney
	43	M	B	Rt nephrectomy (unintentional)	Died 11½ yr later in uremia during left renal exploration
Hejtmancik (1956)	24	F	B	Bilateral ureterolysis	18 mo P O recurrent infection with progressive hydronephrosis
Mass Gen Hosp (1956)	64	M	B	Bilateral nephrostomy (temporary) bilateral ureterolysis	Well 2 yr P O
Iozzi (1957)	44	M	B‡	Lt ureterolysis with pyelostomy (temporary), rt ureterolysis with intubated ureterostomy (temporary)	Well 18 mo P O
Mass Gen Hosp (1957)	56	M	L	Lt ureterolysis	Well 4 mo P O
Talbot & Mahoney[10] (1958)	40	M	B	Rt ureterolysis with T tube drainage secondary rt nephrostomy (temporary)	Well 1 yr P O (spontaneous improvement on left side)
Mulvaney (1958)	51	M	B	Excision of ureteral segment with anastomosis on right, lt nephrectomy	Well 2 yr P O
	43	F	B	Rt ureterolysis with pyelostomy lt nephrostomy	Died P O (disease too advanced at time of surgery)
Mass Gen Hosp (1958)	59	M	R	Rt nephroureterectomy (unable to free ureter)	No follow up
Steuber (1959)	52	M	B	X ray therapy biopsy only	1 yr P O no improvement
	58	M	L	Biopsy lt ureterosigmoidostomy	Died 9 days P O
	30	M	L	Lt nephroureterectomy (unintentional)	No follow up
	62	F	B	Rt nephrostomy (temporary), lt ureteral catheter drainage (12 days)	2 yr P O atrophic rt kidney lt kidney normal
	60	M	B	Rt ureterolysis meticorten therapy	6 mo P O rt kidney unchanged decreased lt hydronephrosis
	56	F	B	T tube drainage	No follow up
	64	M	B	Bilateral ureterolysis	No follow up
Shaheen (1959)	61	F	B	Bilateral ureterolysis with nephropexy	2 yr P O atrophic lt kidney decrease in rt hydronephrosis
	48	M	B	Bilateral ureterolysis parenzyme and meticorten therapy (5 mo P O)	Well 1½ yr P O
Bates[5] (1959)	67	F	B	Bilateral ureterolysis with T tube drainage on lt, ureteral catheter on rt	Well 18 mo P O
Kickham (1959)	46	M	B	Lt nephrostomy with intubated ureterostomy (temporary) rt ureterolysis	Well 5 yr P O
Simon & Nygaard	44	F	L	Lt ureterolysis excision of fibrous mass	Well 4 yr P O

* B = bilateral L = left, R = right

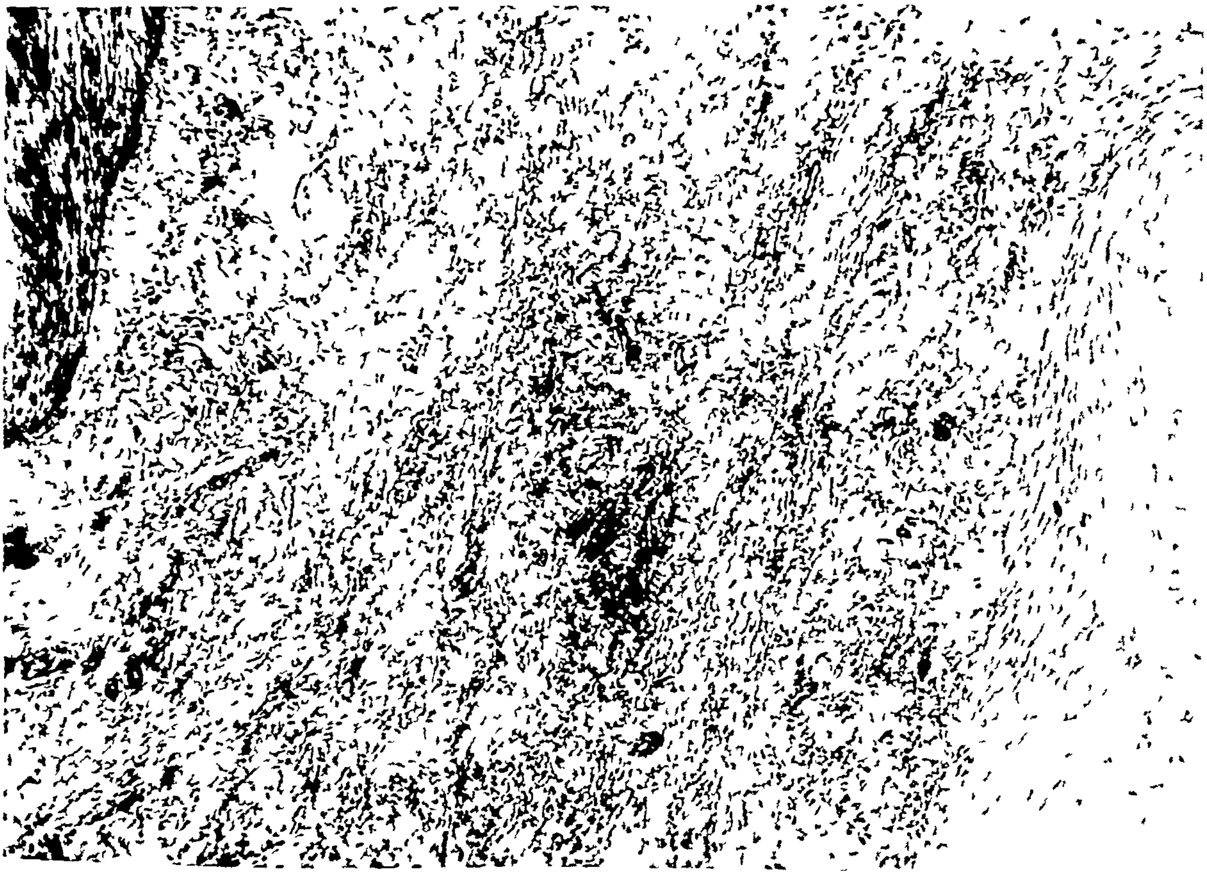
† Two cases excluded because of lack of surgical or autopsy confirmation in one instance and apparent perirenal fibrosis in other case thus differing from entity herein considered

‡ Right side involved 4 mo after exploration on left side

Sections of the uterus, left tube and ovary were essentially normal Some evidence of mild chronic cervicitis was noted but could not be related etiologically to the fibrous tissue previously described

Postoperatively, the patient did extremely well An intravenous pyelogram, performed on the 13th postoperative day disclosed a normal upper urinary tract on the left, with no evidence of the previously noted hydronephrosis The patient was dismissed from the hospital on the next day

During the ensuing four years the patient has continued to do well She has remained asymptomatic, and an intravenous pyelogram performed on Nov 4, 1959, disclosed a normal upper urinary tract bilaterally A small vesical diverticulum was noted on the left, presumably as a result of surgical separation of the fibrous mass from the area of the left bladder base



Photomicrograph of microscopic specimen, showing clusters of lymphocytes, phagocytes, and plasma cells in enormously thick layer of loose fibrous tissue encircling numerous vessels as well as nerve trunks (× 80)

Etiology

A variety of etiological theories have been advanced, ably summarized by Chisholm and coworkers[4] and by Bates[5] Their multiplicity indicates that no one theory explains all cases satisfactorily Indeed, it may well be that this disease entity is the result of a variety of causes The end-result is the presence of a mass of fibrous tissue in the retroperitoneal space, usually extending over the great vessels from the midlumbar vertebrae above to below the bifurcation of the iliac vessels inferiorly In this position it compromises either one or, usually, both ureters, displacing the involved segment medially as a rule Whether the fibrous tissue actually causes occlusion of the lumen, or simply interferes with peristalsis as suggested by Raper,[6] the end-result is impaired transport of urine from kidney to bladder, with resultant dilatation and compromise of the involved kidney and proximal ureter Those cases, such as ours, in which improvement followed simple ureterolysis would tend to support Raper's hypothesis Localization of the fibrous tissue within this retroperitoneal area may well be associated with the anatomic findings of Daseler and Anson[7] They demonstrated the presence of retroperitoneal fascia enclosing the abdominal aorta and the vena cava together with both upper urinary tracts and the para-aortic lymph nodes, thus forming a well-delineated retroperitoneal space

The etiological relationship between the entity herein considered and such entities as perirenal fascitis[3] or periureteritis plastica[2] cannot be further elaborated

Clinical Aspects

Age, Sex, and Affected Side—The age distribution of the 35 patients is shown in Table 2 Nearly 60% of cases are found in the 5th or 6th decades of life, the patients varying in age from 23 to 69 years Twenty-three patients were men, a 2-to-1 ratio to women (12 cases) In 28 instances both kidneys were ultimately involved, and in 7 cases involvement was unilateral only We do not know whether any of the other six reported patients eventually developed obstruction contralaterally, since a sufficient follow-up was recorded in only one instance [8]

TABLE 2 —Age of Thirty five Patients with Idiopathic Retroperitoneal Fibrosis

Age, Yr	No of Cases
20 29	5
30-39	3
40-49	11
50 59	9
60-69	7

Signs and Symptoms—Tenderness in one flank was by far the most common physical finding (Table 3) In only two instances was bilateral tenderness noted Hypertension was present in nine patients Pyuria was found in two-thirds and hematuria (gross or microscopic) in one-third of the patients Seventeen patients were azotemic at the time of diagnosis, and 5 of these had secondary anemia

Flank pain was the most common symptom, occurring in over one-half of the cases Nausea and vomiting with weight loss and abdominal pain were other complaints and illustrate the common occurrence of gastrointestinal symptoms in cases of obstructive uropathy involving the upper tracts Perhaps the most dramatic symptom, anuria, occurred in four instances Edema of the lower extremities was also noted in four cases, presumably resulting from lymphatic obstruction as a result of the retroperitoneal fibrosis [9]

Diagnosis—There is nothing absolutely characteristic in the clinical picture to indicate the true nature of the disorder in a given case Urographic findings are paramount in the diagnosis of idiopathic retroperitoneal fibrosis Intravenous pyelography was carried out on 20 of the patients but was not done on the remainder because of impaired renal function In every instance significant abnormality was noted, although in several cases a normal study had been obtained some time previously Unilateral nonfunction or hydronephrosis were noted in six cases each, and in five additional patients unilateral nonfunction with contralateral hydronephrosis was noted Bilateral hydronephrosis was found in two instances, and unilateral nonfunction with medial deviation of an otherwise normal contralateral ureter was noted in the final case

Retrograde pyelography was accomplished in all but four of the reviewed cases This demonstrated bilateral hydronephrosis in 15 instances, of which ureteral narrowing was also evident in 3 cases In four additional patients, unilateral hydronephrosis with inability to catheterize the contralateral ureter was noted Unilateral hydronephrosis was demonstrated in eight cases, in two of which ureteral narrowing was also evident In one additional patient only one ureter could be catheterized, and although architecturally normal, it was noted that the ureter was medially deviated This latter finding is observed not infrequently In the final three cases, attempted retrograde catheterizations were unsuccessful because of apparent ureteral obstruction

Differential diagnosis must include [1] the various intrinsic causes of ureteral obstruction, particularly in the rare unilateral cases Such varied extraureteral causes of obstruction [2] as metastatic retroperitoneal malignancy,[3] the malignant lymphomata,[4] and the several probably related but distinct varieties of extrinsic fibrosis, such as perirenal fascitis and periureteritis plastica, are also to be considered

The diagnosis is established by surgical exploration Gross and frozen-section microscopic findings at surgery will permit accurate diagnosis and proper therapy Possible involvement of the contralateral side in seemingly unilateral cases should be determined at the time of exploration, because in a number of instances either later contralateral surgery was necessary, or follow-up x-ray studies indicated progressive destruction of the unexplored kidney Long-term urographic follow-up of presumed unilateral cases is advisable to anticipate further involvement of the "uninvolved" side

Treatment

The varied forms of treatment used in these cases are listed in Table 1 Ureterolysis was by far the most common procedure, being carried out in 25 instances Seven patients in whom involvement was bilateral had ureterolysis on only one side, intubated ureterostomy being performed contralaterally in one instance and nephrectomy in three others In four instances the involved segment of freed ureter was excised with end-to-end reanastomosis Temporary urinary diversion (nephrostomy, pyelostomy, or ureterostomy) was carried out in five patients, usually because of renal infection Supplementary

TABLE 3 —Signs and Symptoms in Thirty five Cases of Idiopathic Retroperitoneal Fibrosis

Signs	No of Cases	Symptoms	No of Cases
Flank tenderness		Flank pain	19
Unilateral	16	Vomiting	17
Bilateral	2	Nausea	14
Hypertension	9	Weight loss	12
Palpably enlarged kidney		Abdominal pain	11
Unilateral	3	Backache	8
Bilateral	1	Anorexia	6
Urinalysis		Anuria	4
Pyuria	24	Leg edema	4
Microhematuria	12	Frequency of urination	4
Positive culture	6	Fatigue	3
Azotemia	17	Fever	3
Anemia	5	Hematuria (gross)	1

x ray therapy (two cases) meticorten therapy (three cases), or excision of the fibrous mass (the present case) were also used In the entire group (25 cases), results were excellent in 17 cases (Table 4), improvement was minimal in 2 instances and results were poor in 3 cases, one of the patients dying postoperatively In two of these latter three instances, definitive surgical treatment had been unduly delayed by the patient so that surgery became a 'last resort' endeavor Follow-up was not recorded for three patients

TABLE 4 —Results of Therapy in Thirty five Cases of Idiopathic Retroperitoneal Fibrosis

	Ureterolysis (25 Cases)		Other Therapy (10 Cases)	
	No	%	No	%
Alive and well	17	77	1	17
Essentially unchanged	2	9	2	33
Worse or deceased	3	14	3	50
No follow up	3		4	

In 10 instances ureterolysis was not carried out a variety of other procedures were attempted—nephrectomy (3 cases), temporary urinary diversion (2 cases), ureterosigmoidostomy (1 case), nephrostomy (temporary) and ureteral dilatation (1 case), x ray therapy (1 case), and exploration with biopsy only (2 cases) In one case (biopsy only) the patient was alive and well five years later In two patients the condition remained essentially unchanged, and three patients died in uremia from nine days (ureterosigmoidostomy) to 11 years later Follow-up was not recorded in four cases

Thus, it seems evident that surgical exploration with ureterolysis offers a good prognosis in this otherwise progressive disease, provided undue delay does not result in hopeless attempts at surgery Preliminary nephrostomy in the severely infected or uremic patient and supplemental measures, such as x ray or meticorten therapy, may prove useful

Summary

We have presented an additional case to the thirty four cases of idiopathic retroperitoneal fibrosis causing ureteral obstruction that have been reviewed in the literature The diagnosis is suggested urographically and confirmed by surgical exploration Ureterolysis has provided the best results and should be carried out at the time of surgical exploration, with performance of nephrostomy or other temporary urinary diversion in selected cases Actual excision of the fibrous tissue, as done in our case, is a technically tedious procedure because of the intimate association of the tissue with the great vessels at the pelvic brim, and is probably unnecessary All patients should be followed up postoperatively, to anticipate contralateral progression in the unilateral cases and possible recurrence of obstruction in any instance

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Dr Jane Lester carried out the pathological studies for this report

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PRESIDENT OF THE MEDICAL SOCIETY OF NEW JERSEY—In 1864, (Dr Ezra Mundy) Hunt was elected the 71st President of The Medical Society of New Jersey, an organization of which he had become a prominent member His presidential address concerned Our profession in its Three-Fold Relations, as a Science, a Business and an Art ' Dr Hunt continued to be an influential member of the Medical Society of New Jersey throughout his life He served on numerous committees, contributed papers to its *Transactions*, and represented the Society at national meetings A delegate to the American Medical Association in 1865, he subsequently represented New Jersey for several terms and became secretary (1877) of its Section on State Medicine and Public Hygiene (which had been founded in 1873) In 1880, Dr Hunt was a vice-president of the American Medical Association —F B Rogers Help-Bringers Versatile Physicians of New Jersey, New York, Vantage Press, 1960

Surgical Treatment of Ulcerative Colitis in Children

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The course of medically intractable ulcerative colitis in children is discussed in the light of four cases which occurred in an 11-year-old boy and in three girls aged 9, 9, and 8 years. In pathology and clinical course the disease in children differed little from that in adults. In the fourth case symptoms persisted until the age of 18, when laparatomy revealed generalized abdominal carcinomatosis and was followed by death in three months. In the other three cases ileostomy, with more or less extensive colectomy, afforded dramatic relief; this was followed by a marked improvement in nutritional status and a gratifying degree of social development. The authors emphasize the excellent response to surgery in these medically intractable cases, the absence of physical or emotional disability attributable to the ileostomy, and the danger that carcinoma may appear in cases of ulcerative colitis of long standing.

ULCERATIVE colitis is a disease of unknown etiology, common in young persons, and marked by spontaneous exacerbations and remissions. It is most frequent in large urban centers where the stresses of living are most severe.[9] Although it is most frequent in the 2nd, 3rd, and 4th decades of life, a significant number of cases occur in the pediatric age group, particularly around the time of puberty.[13,15] Jackman and associates[11] reported 11% of 871 patients with ulcerative colitis between the ages of 1 and 5 years.

Because of the chronic, relapsing nature of this disease, its occurrence at a time of active growth, and the serious complications associated with it, active medical treatment, with early surgical interference when necessary, is indicated.

Pathology, Clinical Course, and Diagnosis

Pathology.—Pathologically, ulcerative colitis in children is similar to that in adults. It usually takes three forms: (1) universal, in which the entire colon is involved, (2) left-sided, or (3) right-sided. There are instances of localized or "segmental" colitis, but this is rare. The gross appearance depends on the duration of the disease process and whether it is studied during an acute exacerbation. In early cases, in an acute phase, the mucosa is hyperemic, edematous, and bleeds easily with small, shallow, irregular ulcers; later the ulcers tend to become confluent, with thinning of the walls in some areas and fibrosis in others. This progresses to fibrous replacement of the muscle wall, with resultant rigidity of the bowel, pseudopolyps, perforations, abscesses, fistulae, hemorrhages, and strictures. All these follow as a result of the persistent, inflammatory course of the disease. True adenomatous polyps have been reported,[9] but the most severe complication is carcinoma.[1,13,15]

Clinical Course.—Bargen and associates[2] believe that carcinoma of the rectum and colon is 30 times as frequent in patients with ulcerative colitis as in the general population of the same age and sex. It has been claimed that carcinoma occurs only slightly more frequently in patients with ulcerative colitis than in the normal population, but Cattel and Boehme,[3,4] in reporting nine cases, said that the lack of reported carcinomas is due to the lack of late follow-ups, deaths due to carcinoma while patients are in remission or without autopsy proof, or patients who have not had surgery when carcinoma is not known to be present. Colcock[7] had a 33% incidence of carcinoma in patients who had had ulcerative colitis for more than 9 years.

This evidence—that the longer ulcerative colitis is present, the more likely that malignant change will occur—makes active treatment of childhood ulcerative colitis imperative. Malignancy in young people is notoriously wild; Chappell[6] had no five year survivals with carcinoma of the colon in patients younger than 16 years. Carcinoma complicat

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ing ulcerative colitis is also known for its rapid progression Lyons and Garlock[14] had an 18% mortality within three years of discovery of carcinoma in nine ulcerative colitis patients It is thought that this complication usually follows pseudopolyp formation, but it has been seen in patients without polyps, and Wilcox and Beattie[20] think that carcinoma is due to an epithelial hyperplasia and malignant transformation secondary to the inflammation and ulceration, regardless of polyp formation Other complications in children are arthritis, pyoderma gangraenosum, and liver damage, which may be more severe and incapacitating than in adults

Diagnosis—The onset and course of ulcerative colitis are widely variable, with episodes of remissions and exacerbations, or it may be persistent or become arrested When the inflammatory process is mild and limited to the rectum or rectosigmoid, symptoms may be only those of bloody mucus in the stools, but as the disease increases in extent and severity, the symptoms become more pronounced and the clinical picture more severe Diarrhea develops, and the patient has 15 to 20 stools of mixed blood and mucus daily Abdominal pain, or tenderness, or both may, or may not, be present Fever develops without marked leukocytic response Anemia, weight loss, and dehydration develop with associated marked debility and weakness

The diagnosis is made mainly from symptoms and proctoscopic and x-ray findings On proctosigmoidoscopy the early disease reveals a thickened, friable mucosa with persistent ulcerations of varying size and depth, and there is a blood-streaked, dirty gray discharge[10] More extensive disease reveals pseudopolyps, crypt abscesses, and extensive ulceration Examination of the stool for specific pathogens, ova, and parasites is unrewarding X-ray findings are not always specific, showing early in the course only simple irritability, next progression to a serrated appearance of the early superficial ulcers, and, finally, the shortened, rigid, tubular colon without haustrations, decreased in caliber, and with evidence of poor emptying

Treatment

Medical Management—There is no specific medical treatment for ulcerative colitis Initially, the patient should be hospitalized at bed rest Transfusions, parenterally given fluid, and electrolyte therapy are essential to correct circulatory derangements A diet that is appetizing and to the patient's taste, fed in multiple, small feedings, supplemented by vitamins, helps to correct the malnutrition Sedatives are essential and antispasmodics usually helpful Nonabsorbable sulfonamides, penicillin, chloramphenicol (Chloromycetin), and streptomycin may all be of some benefit, but chemotherapeutic drugs should be used without great expectations of dramatic results ACTH has contributed markedly to stop the progression of the pathological process but must be given with the care always necessary in the use of adrenal cortical agents Psychological support is often helpful, but care must be taken in acute episodes to avoid exacerbation of the condition [10]

Dennis and Karlson[8] found that 71% of their patients died of this disease when treated nonoperatively compared with 20% when managed surgically As a result, they advocate early operative intervention Since this is such a variable disease, indications for surgical intervention must be individualized, but there are certain situations in which surgery is mandatory[17]

Mandatory Surgery—The five instances in which surgery becomes mandatory are as follows 1 Acute fulminating disease which fails to respond to medical management often requires heroic surgical attack In these situations it is necessary for the surgeon to follow the patient s course from the onset of the attack, rather than to be called in when the patient is moribund Barring complications, failure to respond to medical therapy in three to four weeks is an indication for surgical intervention Operation may be necessary earlier if toxicity, hemorrhage, impending perforation, or perforation occur Impending perforation is suggested by distention, tenderness, and increased pulse, in Ripstein's[18] opinion, the best sign is a plain x-ray film of the abdomen indicating a grossly dilated colon or segment of colon in the absence of small-bowel distention Children and adolescents are more likely to recover with a normal-appearing colon after these acute fulminating episodes than are adults, and, as a result, more prolonged medical treatment is justified in children Ripstein[17] believes that a total colectomy should be performed as a primary procedure in these conditions, since simple ileostomy does not remove the cause of the disease 2 Another mandatory indication is carcinoma or suspected carcinoma Since the incidence of carcinoma increases with the duration of the disease and the malignancy is rapidly progressive, we think that surgical extirpation should be undertaken before this complication has a chance to develop 3 Systemic manifestations such as pyoderma gangraenosum, liver damage, and arthritis, when incapacitating, are solid indications for surgical intervention 4 Benign stricture with obstruction necessitates surgery 5 Chronic disease that is intractable or involves invalidism requires surgery Of the patients with chronic disease, about 20 or 30% will fall into the group requiring surgery because of invalidism or complications

Choice of Operation—The choice of operative procedure has been a source of controversy for some time Probably the least effective procedure is vagotomy, and its only usefulness is in patients in whom the disease involves the remaining small intestine after colectomy[8]

Ileostomy as a procedure primary to performance of a colectomy has been advocated[9] A critical analysis of the results indicates that this is associated with a higher mortality than is primary colectomy[8, 17] which, therefore, seems to be the best surgical method The remaining rectal stump must be watched carefully, and if the disease fails to heal or progresses, a secondary abdominoperineal resection is indicated If the rectal stump heals, an ileoproctostomy may be considered, but it must be understood by patient and physician that the mortality from early and late complications is twice that of ileostomy with proctocolectomy[8]

The postoperative complications of ileostomy with electrolyte derangements, skin excoriations, prolapse, fistula, obstruction, and stenosis will occur in a certain group of patients, many observers think that this is more likely in children and that the pediatric group tolerates ileostomy poorly This has not been our experience Turnbull believes that these complications can be obviated by protecting the serosal surface of the ileostomy with a mucosal graft[19]

Report of Cases

Case 1 —A 9-year-old girl experienced mild diarrhea during a period when her mother and father were in the process of obtaining a divorce Sedation and a low-residue diet resulted in a definite initial improvement The patient gained weight, felt well, and had normal bowel movements for six months She then developed severe abdominal cramps, bloody diarrhea, anorexia, and a distressing pyoderma Proctoscopic examination revealed a friable mucosa which bled easily and was interpreted as being typical of a moderately severe ulcerative colitis The roentgenographic studies of the colon disclosed a normal colon with haustral markings and a pliable wall

Treatment on admission consisted of medication with succinylsulfathiazole (Sulfasuxidine), phenobarbital and atropine, and a bland diet There was again marked improvement for three months, when the child was readmitted with essentially the same complaint In addition, on this occasion, she had developed a rather severe polyarthritis Treatment consisted of medication with the various tetracycline derivatives and large doses of ACTH The family environment remained unchanged Notwithstanding this, the patient's condition again improved, she developed a normal appetite, gained weight, and reestablished nearly normal bowel habits

Improvement continued until the patient was 11 years old, when all her symptoms recurred Thereafter, there were many exacerbations of the disease, requiring numerous and prolonged hospital admissions The child, while very intelligent, behaved in an unpredictable and frustrating manner and was obviously extremely disturbed The security afforded by a normal home environment was unobtainable Numerous psychiatric interviews with all members of the family failed to furnish the child relief or reassurance She had lost all contact with, and interest in, school

The patient was 12 years old when surgical consultation was first sought Physical examination at this time revealed a thin, pale, emaciated child She had fever and tachycardia Her entire abdomen was moderately tender Proctoscopic examination to a level of 9 cm revealed an inflamed, constricted rectum with marked pseudopolyp formation She had severe secondary anemia and an elevated leukocyte count Gross or occult blood was always demonstrable in the stools Many examinations for ova and parasites were negative The electrolyte pattern and blood protein studies were within the limits of normal Roentgenologic examination of the colon showed a loss of all haustral markings, shortening of the colon, and extreme rigidity of the walls

The internist, psychiatrist, and surgeon agreed that the condition, in this instance, was not amenable to medical treatment and advised surgical intervention An ileostomy and subtotal colectomy were performed when the child was 12 years old Her response to this was dramatic, but because of the marked pseudopolyp formation and the mother's frequently expressed fear of the development of cancer in the rectum and sigmoidal stump, this portion of the colon was removed six months after the initial procedure by combined abdominoperineal resection of the rectum and sigmoid colon

This patient's course has been followed for six years She is now an attractive young woman, active, interested in her college work, and outstanding in the school athletic program Her ileostomy has given her no difficulty, and it always requires a telephone call to induce her to come for a semiannual checkup Her parents still cannot get along with, or without, each other

Comment—This case illustrates the many facets of the diagnosis and treatment of ulcerative colitis in children The importance of psychogenic disturbances as either a primary or contributory factor in the cause of the disease is well illustrated here Probably, if the role of the parents in stabilizing emotional factors involved in this child's illness could have been established earlier in the course of the disease, surgery would not have been necessary That the parental insecurity was not the dominant factor, however, is well proved because it still exists, and the patient is well and happy without her colon

The remarkable ability of a child to adjust to ileostomy is attested by the fact that this young woman is one of the leaders in her class and has never complained of or even mentioned the ileostomy This further convinces us that ileostomy and total colectomy is the procedure of choice in the surgical treatment of many cases of ulcerative colitis The rare exception is the segmental type, not involving the rectum Whether the procedure is accomplished in one or two stages is not too important It depends entirely on the general condition of the patient at the time of the initial surgical procedure It is also noteworthy that none of our cases, either in children or adults, has resulted in any degree of impotence

Case 2 —An 11-year-old boy consulted his family physician because of a profuse, bloody diarrhea Complete examination at that time, including proctosigmoidoscopy and complete roentgenographic studies of the gastrointestinal tract, failed to reveal the cause of bleeding The patient first responded quite well to antispasmodics, mild sedatives, and a nonresidue diet About one year after the initial symptoms, the patient had a similar attack which persisted for a longer period On this occasion he developed painful furuncles on his body He was put on the same regimen as previously and, in addition, was given large doses of azosulfamide (Neoprontosil) His response again was dramatic

The condition recurred in three months, however, and it appeared that the child had an acute abdomen, probably an impending perforation of a viscus He was given fluids parenterally, blood transfusions, and plasma and responded only fairly well Proctosigmoidoscopic examination at this time revealed friable, edematous mucous membrane of the entire rectum and distal colon Roentgenographic studies were typical of ulcerative colitis in that the left half of the colon was rigid, like a pipe, and the haustral markings were not discernible The patient was then placed on therapy with various steroid preparations During the next three years there were many exacerbations, and the disease was present almost constantly The patient lost a great deal of weight, spent most of his time in the hospital, and developed edema of both extremities and the dependent portion of his body

When seen by us at the age of 17 years, he had been hospitalized most of the time for the preceding few years He was extremely emaciated The plasma protein content was diminished and there was an inversion of the albumin-globulin ratio The electrolyte pattern was confusing in that the patient had both low sodium and low potassium determinations Proctosigmoidoscopic examination revealed the formation of pseudopolyps visible along the entire length of the proctoscope He was given another plasma transfusion and ileostomy and subtotal colectomy were performed His convalescence was remarkable He gained 21 lb in the first month after his operation, the edema disappeared and he has had few absences from work since the performance of this procedure

Comment—Undoubtedly, the combination of a delayed diagnosis and the failure of empirical, and later more specific, therapy in this instance resulted ultimately in both local and systemic changes that approached irreversibility Notwithstanding the long periods of hospitalization, the careful laboratory studies and the vigorous attempts to correct or even control electrolyte and plasma protein deficiencies, the imbalance was so severe that the patient was nearly moribund when surgical advice was sought It is possible that earlier and more variable and vigorous steroid therapy might have changed the outlook, but in this instance we believe it falls into the category described by Kirsner and Palmer,[12] representative of a small group of cases not responding to any medical therapy with the disease progressively increasing in severity and apparently dealt with only by operation

There was little question that colectomy was a lifesaving procedure in this case There may have been psychiatric factors or a personality problem in the background of this patient, although his family was observed carefully and the patient appeared well balanced, secure, and happy in his home environment The facts that the patient has a perfect work record is married and happy, and has a child bear out the supposition that the psychogenic element was not a factor in this case It is obvious that subtotal colectomy and ileostomy changed this patient from a bedfast invalid to a useful and valuable citizen in his community He has refused removal of the remaining segment of the sigmoid and rectum The pseudopolyps are still in evidence however, at the time of writing, and every attempt is being made to have him return for the removal of this portion of the colon because of its malignant potential

CASE 3—A 9-year-old girl developed a rather severe, prolonged spell of bloody and mucoid diarrhea This responded to small doses of paregoric and antispasmodics The general examination at this time was unrevealing

A similar attack occurred one year later Physical examination showed evidence of some weight loss and a tender abdomen, and proctoscopic examination revealed what appeared to be an early ulcerative colitis The patient was put on therapy with antispasmodics, a bland diet, and azosulfamide with dramatic results In the subsequent six to eight months she had an exacerbation of the condition, which improved after a regimen of nonirritative diet and azosulfamide

When the patient was 15 years old, she had a severe attack and showed evidence of weight loss Proctosigmoidoscopic examination revealed a rectal mucosa typical of rather severe ulcerative colitis Roentgenographic studies of the colon showed loss of haustral markings and a rigid colon extending almost to the hepatic flexure Her internist observed her carefully every month until the colon appeared to be normal The treatment during this period consisted of medication with sulfa drugs and antispasmodics, and reassurance

She failed to return or respond to requests for a check-up until she reached the age of 18, when she was admitted to the hospital with severe symptoms characteristic of ulcerative colitis Proctoscopic examination showed multiple pseudopolyps, and she was put on steroid therapy

The patient was examined six months later, proctoscopy revealing the continued presence of pseudopolyps and ulceration, and masses were palpable high in the rectosigmoid colon Biopsy was consistent with infiltrative adenocarcinoma At laparotomy, a generalized abdominal carcinomatosis, which also involved the liver, was demonstrable Temporary colostomy for obstructive symptoms was performed The patient died three months after operation Autopsy showed evidence of three carcinomas in the colon

Comment—This case illustrates the effect of the most serious complication of ulcerative colitis, namely cancer In addition it shows the value of periodic examinations in younger individuals with ulcerative colitis, even though they are apparently in a remission It is debatable whether the outcome would have been different had the patient returned for a colectomy when the pseudopolyps first developed and progressed so rapidly Carcinoma has complicated ulcerative colitis in 14 cases seen by us in all age groups, and none of these patients are alive at the time of writing or have survived even five years The fact that the incidence of carcinoma in ulcerative colitis is directly proportionate to the duration of the disease seems to us to make operation in intractable or refractory cases, especially in children, even more imperative than in adults

CASE 4—A female child, with a history of intermittent colic since the age of 1 year, was first seen at the age of 8 She reportedly had frequent episodes of bloody diarrhea after colds, emotional stress, exposure to high altitude, and solar exposure An appendectomy had been performed one year previously because of acute abdominal pain Now an exploratory celiotomy was performed and ulcerative colitis found, the entire colon and a portion of the ileum appearing involved

At the age of 10 years the patient began to have generalized swelling with pain, and a positive lupus erythematosus test was reported For the next three years her course was one of unremitting diarrhea, chronic anemia, delayed growth, frequent arthralgia, pyoderma gangraenosum, and marked debility The child was treated with sulfa drugs, mycin drugs, cortisone, prednisone (Meticorten), iron, vitamins, and blood transfusions

At the age of 13 years she had an ileostomy and subtotal colectomy One year after surgery, she had gained 23 0 lb (10 4 kg) and grown 2¾ in (7 cm) She experienced some proctitis and bleeding from her rectal stump Removal of the rectal stump and revision of the ileostomy were performed Subsequently, she has shown marked improvement in temper and appetite and a general sense of well being, and is entirely off steroid therapy at the time of writing

Comment—This young patient exemplified the necessity of definitive treatment in a carefully studied, well treated and meticulously followed up case of ulcerative colitis, at any age, which proves to be irreversible and fails to respond to conventional and all combinations of medical treatment The constant diarrhea, impairment of physical development, painful arthralgia, and disfiguring pyoderma in this well-adjusted and secure child suggest that even earlier surgical intervention might have proved advantageous This girl, now a beautiful young woman, is a permanent member of, and will soon become a leader, in our ileostomy club Her ileostomy has never been a detriment to her social activities These facts attest to the soundness of the fundamental philosophy of the procedure

Summary

Ulcerative colitis is not rare in the pediatric age group Because of its chronic, relapsing nature, its occurrence at a time of active growth, and the severe associated complications such as perforation, hemorrhage, arthritis, liver failure, and carcinoma, this disease requires careful evaluation and delicate care Surgical intervention should not be withheld in irreversible cases The only adequate surgical procedure is an ileostomy and a colectomy, with or without proctectomy

In this review, four cases have been presented One is that of a 9-year-old child with an emotional disturbance, with persistent and recurrent symptoms, who had received careful and excellent medical treatment Her course was followed until proctoscopic and roentgenographic studies revealed the presence of marked pseudopolyp formation and the laboratory findings showed a persistent and severe secondary anemia The response to ileostomy and total colectomy has been dramatic and her adjustment to ileostomy and to her environment has been exceptional

The second case, which is typical of the disease in children, was one in which a delayed diagnosis, combined with procrastination and differences in opinion regarding the proper treatment of the condition in children, almost resulted in a fatality Treatment in this instance restored the patient from invalidism to being a useful citizen

Another case was that of a 9-year-old girl whose ulcerative colitis illustrated the effect of the most serious complication of the disease, namely inoperable cancer The high incidence of carcinoma in long-standing, severe cases of ulcerative colitis was further emphasized in this review

The fourth case was a young child who had been ill since the age of 8 years Her symptoms originally were frequent and bloody stools This patient had run the gamut of medical treatment and had had all the complications, including unremitting diarrhea, chronic anemia, delayed growth, arthralgia, pyoderma, and marked generalized debility She had been treated with all the available conventional drugs and modalities At the age of 13, when she was finally subjected to an ileostomy and a subtotal colectomy, her response was remarkable She has shown a weight gain, increase in size, and has been restored to being an excellent student and useful member of her community

This study indicates that once a case of ulcerative colitis is irreversible, regardless of the patient's age, active surgical intervention is indicated, The response, in our experience, has always been dramatic Children adjust much more readily to an ileostomy, once they understand it, than do adults

1839 High St (18) (Dr K C Sawyer)

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ALMSHOUSES —The almshouses, were of no avail to outside patients In an effort to care for this element, medical groups in large towns—beginning at Philadelphia in 1786—established dispensaries which provided drugs free of cost These were modeled on an earlier one set up by the London College of Physicians No such motive obtained in American cities, where physicians sold their own drugs The dispensaries seemed to be in harmony with the humane instinct of the times They subsequently evolved into the outpatient departments of modern hospitals —R H Shryock, Medicine and Society in America 1660-1860, New York University Press, 1960, page 105

Body Temperature Regulation During Anesthesia in Infants and Children

Constant Monitoring of Body Temperature Helps to Prevent Complications Associated with Hypothermia and Hyperthermia

C R Stephen, M D , Sara J Dent, M D , K D Hall, M D ,
Paul R Knox, M D , and W C North M D , Durham, N C

In modern, air conditioned operating rooms maintained at temperatures between 68 and 72° F (20 and 22 2° C), the anesthetized pediatric patient, being virtually poikilothermic and possessing a relatively large surface area, is likely to lose heat In a series of 600 infants and children between the ages of 1 day and 12 years, the rectal temperature at the end of operation was variable, but under the age of 6 months, a significant reduction in body temperature was common To prevent complications associated with either hypothermia or hyperthermia, it is important to recognize trends as they develop this end is accomplished best by constant monitoring of the body temperature A heating cooling apparatus is described which automatically regulates the body temperature of the patient to within 0 5° C of that which is preset by the physician

AIR-CONDITIONING rapidly is becoming an accepted part of the American way of life Nowhere has the transition from natural to artificially controlled temperature been more complete than in the surgical suites of our hospitals The constant cool environment of operating rooms has altered a number of problems relating to the management of patients Whereas, less than 10 years ago the development of hyperthermia during anesthesia and surgery was of prime concern in both adults and children,[1,2] now attention is being devoted, in children at least, to the problems of inadvertent body temperature reduction during anesthesia[3,4] Moreover, in the present era of development, an increasing number of patients undergoing surgery are being exposed to artificially induced hypothermia in order to safeguard vital functions[5-7] We are becoming more conscious of temperature in the operating room and rightly so The purpose of this report is to indicate the body temperature variations which may occur in infants and children during anesthesia and operation in air-conditioned atmospheres, to discuss methods of controlling body temperature under these conditions, and to illustrate the necessity of constantly monitoring the temperature during and after operative procedures

Factors Influencing Body Temperature

Under normal circumstances in the awake adult, there are three effector mechanisms which regulate heat production and heat loss shivering, cutaneous vasoactivity, and sweating These mechanisms are activated through nervous pathways[8] In the premature baby, the infant under two years, and, to an unknown extent, the older child, sweat production is limited, and the shivering mechanism is unreliable due to the relatively weak musculature[9] When general anesthesia is administered to this age group, practically all possibility of invoking the shivering reflex is abolished and peripheral vasodilation occurs with the loss of vasoactivity, so that changes in body temperature are more or less at the mercy of the environment When we further take into consideration the relatively large surface area of the child compared to body mass, the significance of the cutaneous vasodilation assumes its rightful importance The anesthetized child becomes virtually poikilolthermic,[10] and the smaller the child the greater his dependence on the environment

In the modern operating room, maintained at a temperature between 68 and 72° F (20 and 22 2° C), with a relative humidity of 50 to 60 per cent, the stage is set for the anesthetized, poikilol-

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From the Division of Anesthesia Duke University Medical Center Read before the Section on Anesthesiology at the 109th Annual Meeting of the American Medical Association Miami Beach June 14 1960 thermic patient with a relatively large surface area to lose heat A reduction in body temperature will be promoted further by utilizing a non-rebreathing technique of anesthesia,[2] by the exposure of large skin areas or body cavities to the environment, or by the administration of refrigerated blood to the patient The retention of heat, or a reversal of the hypothermic trend, will be enhanced by employing a to-and-fro or circle technique for anesthesia, by moderately heavy draping of the patient, by the operating room lights, although today many of these radiate minimal amounts of heat, and by warming blood for transfusion approximately to body temperature In today's operating room the odds appear to be in favor of heat being lost during surgery the increasing length of surgical interventions is tipping the scale even more in this respect

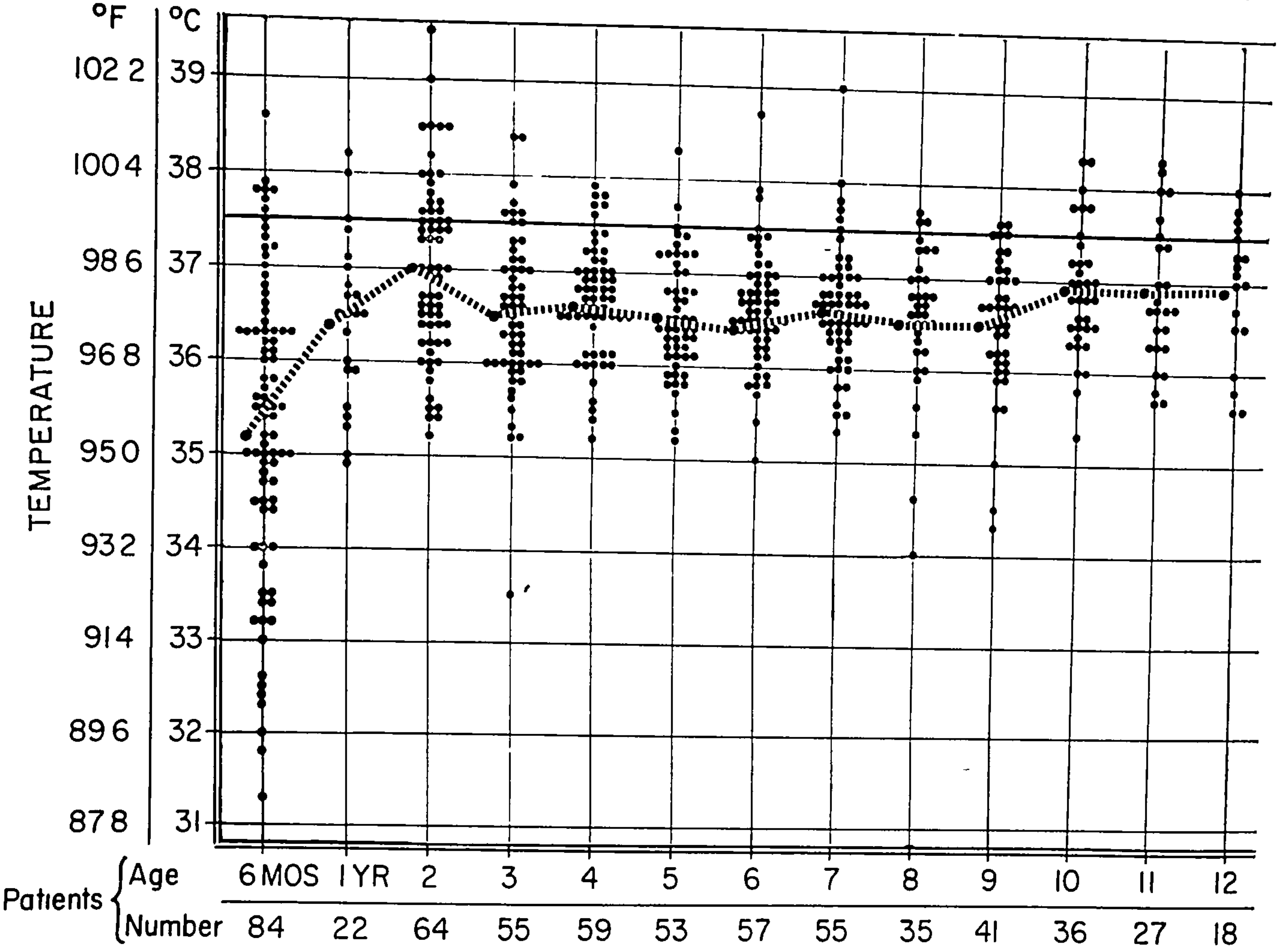


Fig 1 —Scattergraph of rectal temperatures of 600 infants and children after anesthesia and operation

Findings in Six Hundred Patients

In an effort to find out what did happen to infants and children in modern operating rooms, the rectal temperature was taken with low-reading thermometers at the termination of anesthesia and operation in a consecutive series of 607 patients between the ages of 1 day and 12 years (Fig 1) All types of operations were included, and the time in the operating room varied from 30 minutes to 6 hours Operating room temperatures varied between 68 and 73° F, with the relative humidity being maintained between 50 and 60 per cent Some difference of opinion exists regarding the "normal" rectal temperature of the child, in this instance it was taken to be 37 5° C (99 6° F)[11] Nearly all the patients in this series had a rectal temperature within normal limits preoperatively

The rectal temperatures recorded at the end of operation in this series are tabulated in Figure 1 One can see that under the age of 6 months, rather marked hypothermia was observed frequently Between the age of 6 months and 2 years a marked variation was noted, with some patients sustaining a definite reduction in body temperature, while many developed hyperthermia Many of the patients in this age group were subjected to operations in the region of the head and neck, the remainder of their body surface area was covered with several layers of drapes In the groups over 2 years of age, more self-regulation was apparent, although the average rectal temperatures at the end of anesthesia were less than normal Similar findings have been reported recently by Harrison and associates[4] and France[3]

Two examples of the spontaneous variations of body temperature under anesthesia and surgery will be cited Figure 2 shows a fall in rectal temperature from 37 5 to 32 8° C over a period of 160 minutes during a neurosurgical operation in a 3-month-old infant This record illustrates (1) the influence of administering cold blood to the patient, and (2) the finding that the longer the patient is exposed to cool atmospheres, the more profound is the reduction in temperature likely to be

Patients with large body surface areas which have been burned are particularly prone to lose body heat when exposed to a cool environment during anesthesia This situation is exemplified in Figure 3 when, over a period of 135 minutes in a 3-year-old patient with a 40 per cent burn, the rectal

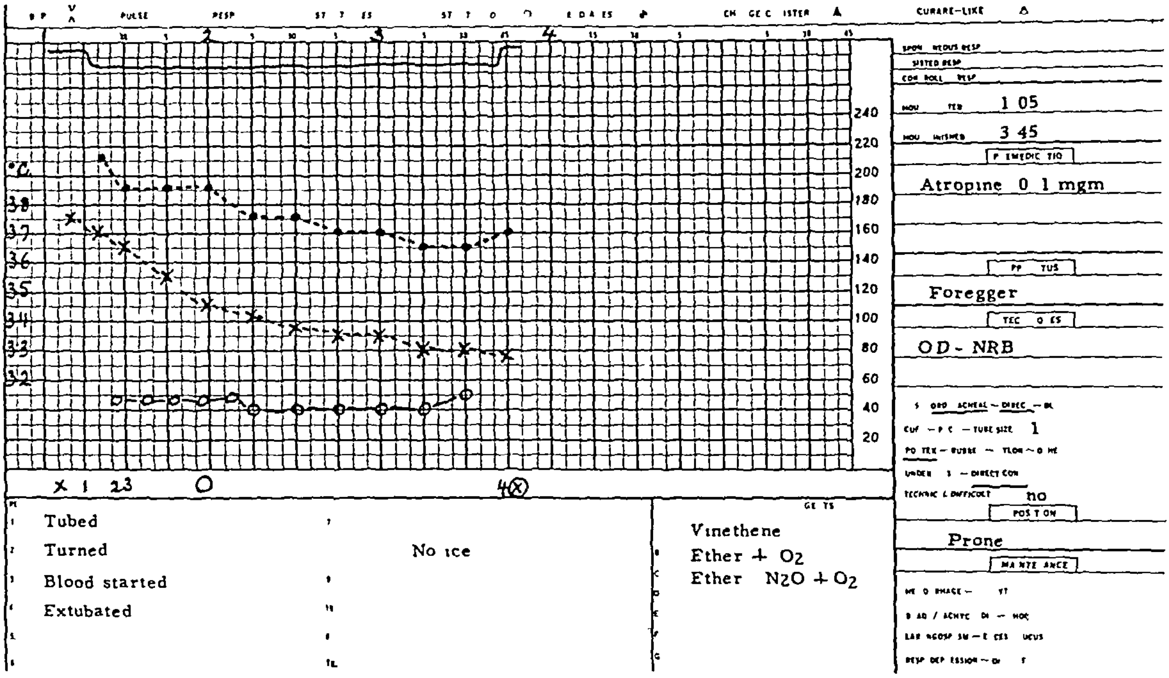


Fig 2 —Anesthetic record of 3 month-old infant who underwent neurosurgical operation Note spontaneous reduction in rectal temperature, perhaps accentuated by administration of whole blood

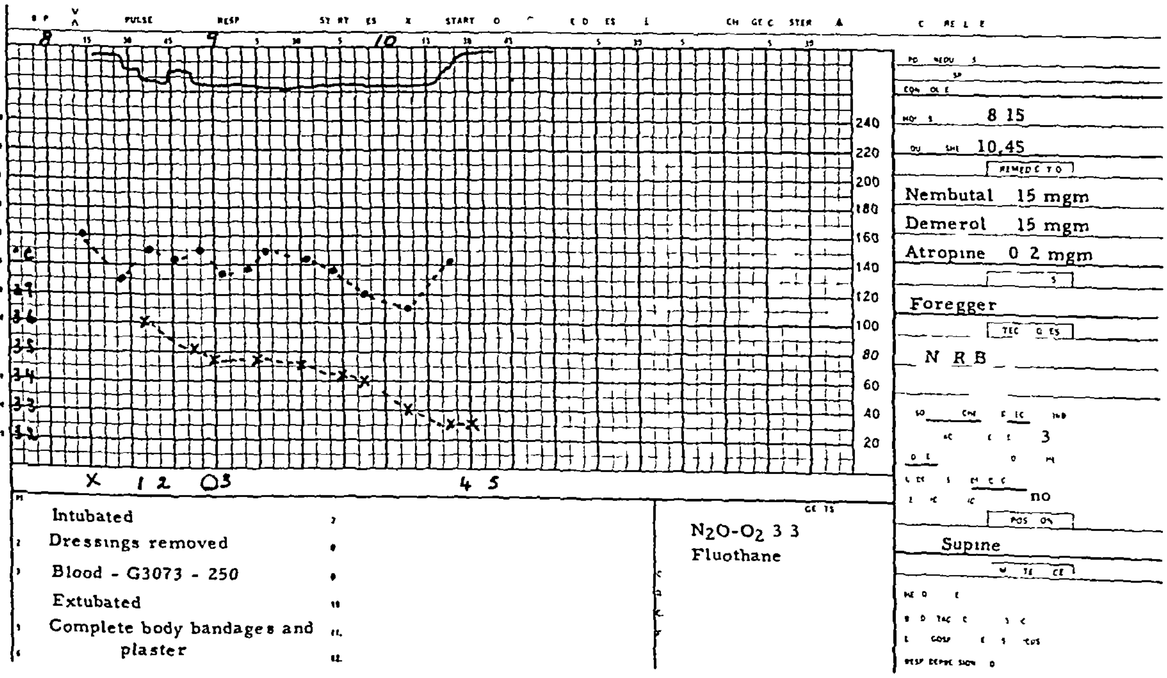
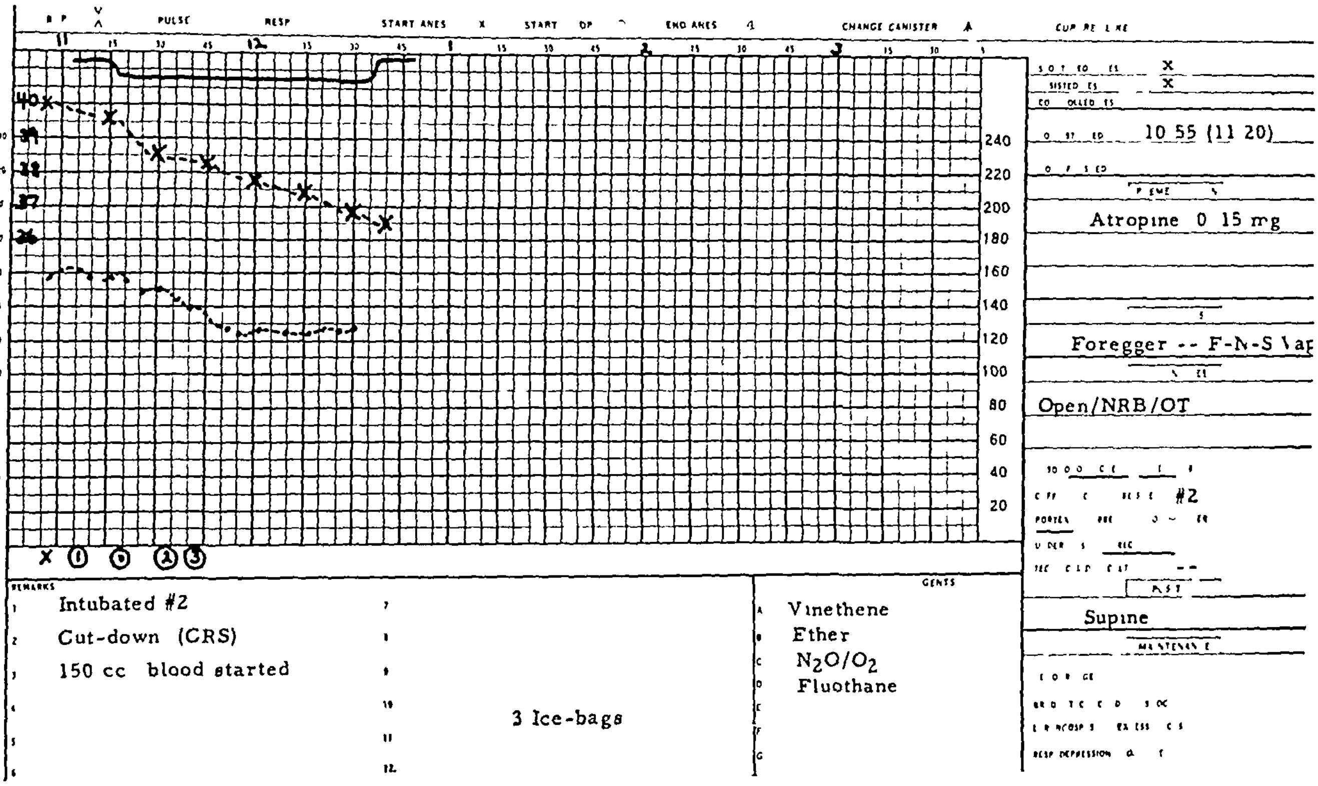


Fig 3 —Anesthetic record of a 3 year-old child with burns involving 40 per cent of the skin surface Note progressive fall in rectal temperature during operation

temperature fell to 32.5° C It should be noted that not all patients in this age group lose body heat, as is shown in Figure 1

Dangers of Hypothermia

In recent years the purposeful provision of moderate hypothermia during certain operative procedures has been endorsed as a valuable adjunct to the management of the patient The reduction of basal metabolism (approximately 6.0 per cent for each °C drop in body temperature) is rightly recognized as reducing oxygen demand and conferring a degree of protection to vital organs against hypoxia Wherein does the danger lie with spontaneous hypothermia as described above? The greatest hazard lies in *lack of recognition* As basal metabolism is reduced, the anesthetic requirements likewise are reduced Below a body temperature of 34° C, minimal concentrations of anesthetic drugs are necessary If hypothermia is unrecognized, and normal anesthetic concentrations are continued, the patient will suffer from relative overdosage and may die In our experience, at least two infants have fallen into this category



10 55 (11 20)

Atropine 0 15 mg

Foregger -- F-N-S Vap

Open/NRB/OT

#2

Supine

1 Intubated #2

2 Cut-down (CRS)

3 150 cc blood started

10 3 Ice-bags

A Vinethene

B Ether

C N_2O/O_2

D Fluothane

Fig 4—Anesthetic record of 18 month old acutely ill infant who underwent exploratory laparotomy and appendectomy Note reduction in rectal temperature with aid of 3 ice bags

The second danger of uncontrolled and unrecognized hypothermia, particularly in infants, relates to the development of the serious and sometimes fatal syndrome of *sclerema* This condition, characterized by an induration and rigidity of the skin and subcutaneous tissues, which soon acquire "the consistency of thick leather," with eventually many of the soft parts appearing "as rigid as wood or stone," has been described recently as a sequence to cold injury of the newborn infant[12] It is stated by Rees[13] to be often a fatal complication of surgery in premature infants An interesting instance of this complication is reported following operation in a 4½ month-old infant in whom the rectal temperature was reduced, partially by intent, to 29° C[14] In our own experience, prior to the time when we became cognizant of the necessity to monitor and regulate body temperature during anesthesia, two infants under 6 months of age developed sclerema postoperatively and eventually died It is doubtful if infants under 6 months of age are able to withstand, for any length of time, body temperatures below 33 to 32° C

Regulation of Body Temperature

Since the body temperature of infants and children during anesthesia and operation is labile and dependent, to a great extent, on the immediate environment, it is important to detect changes as they occur and to have means available to raise or lower body temperature as required When hypothermia is induced therapeutically during anesthesia, a measure of control to prevent inadvertent drift downwards, with the hazard of ventricular fibrillation below 30° C, is of great value

With regard to detection, it is our belief that proper clinical management of the anesthetized infant or child today demands minute-to-minute knowledge of the body temperature Continued monitoring of the temperature may be as important as measuring the blood pressure The insertion of a thermistor from 2 to 4 inches into the rectum, or into the mid-to-lower esophagus, and then connecting the thermistor to a recorder provides clinically acceptable monitoring Available evidence suggests that the esophageal lead provides a more accurate reflection of the temperature of the organs within the trunk and of the cerebral cortex [1,3]

Methods of regulating body temperature in children have dwelt in the past largely on means of cooling Due to the high ratio of body surface area to body mass, and to the vasodilation and absence of shivering under anesthesia, surface application of cold objects is quite efficient in children For example, in Figure 4, an acutely ill infant had her rectal temperature reduced from 40 to 36 5° C over a 100 minute period during operation by the strategic application of three ice-bags To what extent the air conditioned operating rooms assisted the process in this patient is a moot point

A principal problem of management in patients in whom hypothermia is induced intentionally centers about control of the degree of fall and ability to rewarm the patient when desired When spontaneous reductions in body temperature develop, the problem again is one of regulation and rewarming Bigler and McQuiston [1] utilized a rubber blanket under the patient and circulated warm or cold tap water through it, precise regulation of temperature was difficult under these circumstances A few years ago an apparatus (Therm-o-Rite) became available commercially it circulates hot or cold alcohol solutions through large rubber mattresses This method is of value in adults, but is not practical for utilization in infants and small children because the blankets are too large and unwieldy

During the last 18 months we have had an opportunity to evaluate a heating-cooling unit (Aquamatic-K-Thermia) which, in infants and children, permits a degree of control over body temperature not hitherto possible The advantages of this apparatus are several

1 Malleable, plastic blankets through which water circulates are available in several different sizes These pads can be placed in close contiguity with the body surface of the infant or child From one to four pads can be connected to the unit at any one time To accommodate patients of different body surface areas, and in order to apply the blankets snugly in nonoperative positions, the following sizes are available 24-by-60, 17-by-24, 12-by-15, and 14-by-3 inches

2 An extremely sensitive yet stable thermistor, whose lead-off wires are enclosed in an atraumatic polyethylene tubing, can be inserted easily into the esophagus or the rectum of the smallest infant

3 The wires from the thermistor plug into an electronic control box, which consists of a series of bridge relay circuits This control box is unique in that it is sensitive at all times to the body temperature of the patient and also responds automatically to the temperature desired in the patient, which is pre-set by the anesthesiologist or the surgeon In Figure 5, the control box sits on top of the main body of the apparatus On the face of this box are two dials The smaller dial is set by the anesthesiologist at the temperature he desires in the patient The larger dial below, which has a scale of + 2 5° to − 2 5° F, indicates how far removed the actual temperature of the patient is from the desired tem-

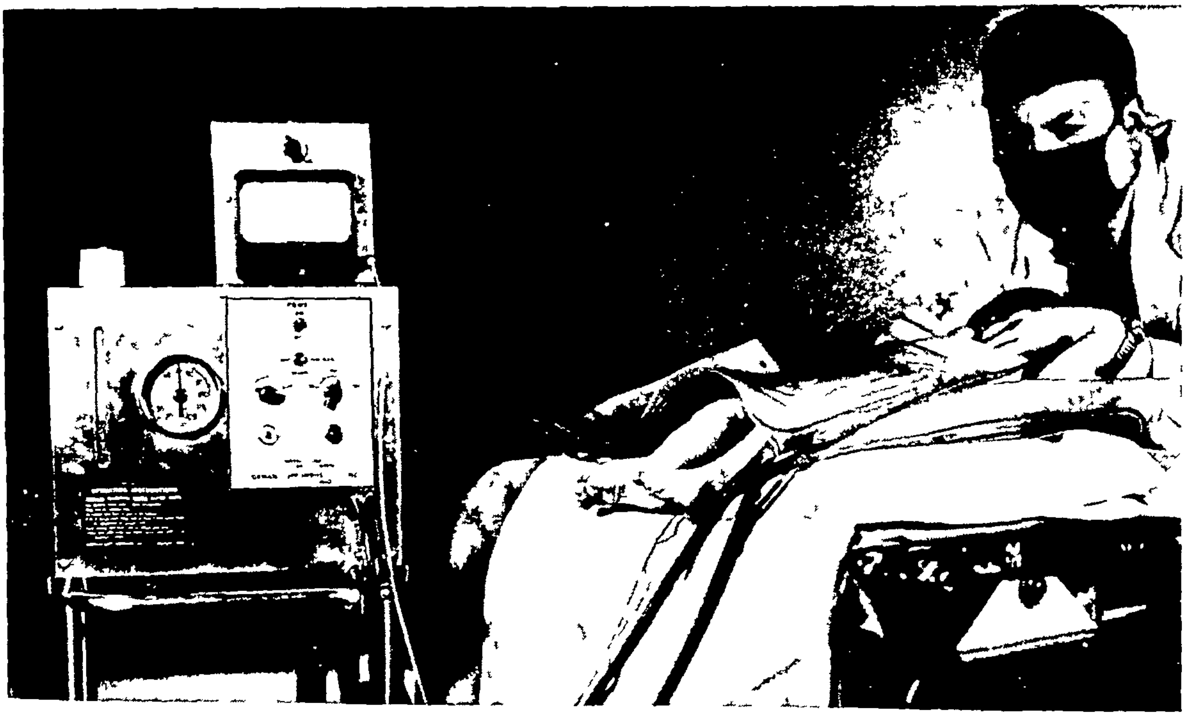


Fig 5 —Photograph of heating cooling apparatus Electronic control box sits on top of main structure

perature By zeroing the larger dial through adjusting the smaller scale, one can determine at any moment the existing body temperature of the patient

4 In the main body of the apparatus there is a heating unit and a refrigeration unit These units are *motivated automatically* by signals from the electronic control so that warm water or cool water is circulated constantly through the plastic pads If the pre-set temperature desired is lower than the body temperature of the patient, cold water will circulate through the pads, and vice-versa As the body temperature approaches that desired, the temperature of the circulating water will be regulated accordingly After the desired temperature has been reached, the apparatus will cycle automatically to circulate warm or cool fluid in an effort to stabilize the patient at the desired temperature The temperature of the patient can be maintained automatically within ± 0 8°F of that pre-set by the physician On the front of the apparatus is a needle dial which monitors continually the temperature of the circulating fluid

5 The total liquid capacity of the combinations of pads used is not more than one quart This comparatively small amount of water allows rapid changes in the temperature of the pads A one-quart reservoir assures replacement of any fluid lost by evaporation, spilling or leakage

6 There are two other dials on the front panel of the body of the apparatus which allows one to regulate manually the temperature extremes of the water circulating in the pads Such regulation by the physician prevents the circulation of what he may consider too hot or too cold fluid We have found by experience that, if during the rewarming period the temperature of the circulating fluid is greater than 108° F (42 2° C), burns are likely to be produced, particularly over pressure areas

Figure 6 illustrates the employment of this apparatus in a 7-week-old infant who was subjected to a bilateral inguinal herniorrhaphy over a period of 200 minutes Orotracheal, non-rebreathing nitrous oxide, oxygen, and ether were employed for anesthesia Shortly after induction the heating-cooling unit was activated, with the temperature pre-set at 35°C Within 30 minutes the body temperature of the infant had reached this level and was maintained there for 105 minutes At this time the control dial was re-set to 37°C , and the body temperature of the infant began to rise immediately At the end of the operative procedure, 40 minutes later, the rectal temperature was 36 8°C

In over 300 infants and children up to the age of 10 years, we have found this apparatus to be reliable and consistent in operation It permits stabilization of the body temperature at any desired level and it will induce moderate degrees of hypothermia or produce rewarming rapidly and effectively It has been found valuable in controlling body temperature postoperatively and is most useful in warming patients whose body temperature has fallen inadvertently while in the operating room

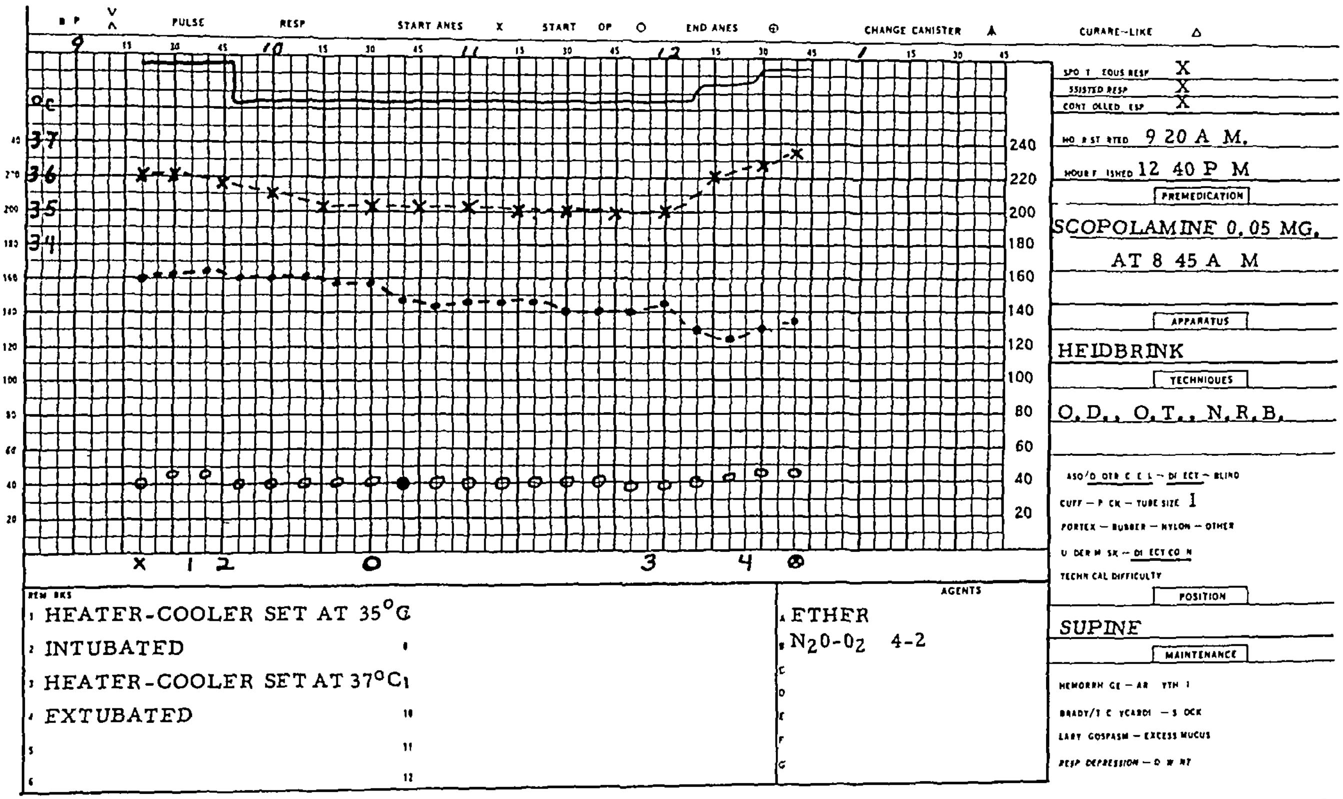


Fig 6 —Record of rectal temperature, pulse rate, and respiratory rate in 7 week old infant who underwent bilateral inguinal herniorrhaphy Note rectal temperature controlled at 35 C by automatic heating cooling unit, with increase in temperature towards end of procedure by resetting apparatus

Summary

In air-conditioned operating rooms, the body temperature of infants and children is prone to fall during anesthesia and operation In situations where spontaneous hypothermia may occur, or when a degree of induced hypothermia is desired, recognition of changes in body temperature and a means of regulating body temperature, either up or down, are important factors in management To accomplish the first requisite, it is suggested that the body temperature be monitored continually in every infant and child who is undergoing a major surgical procedure, or one of any length In our experience, regulation and control of body temperature can be obtained satisfactorily in children by utilizing a heating cooling unit which automatically and in a short period of time will stabilize the body temperature at a level which is pre-set by the physician

We wish to acknowledge and thank the nursing staff of the Recovery Room for their cooperation and interest in this project

The Aquamatic-K-Thermia unit used in this study was supplied by Gorman-Rupp Industries, Bellville, O

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EVOLUTION OF ENDOTRACHEAL INTUBATION —Endotracheal intubation was probably first performed by the eminent Belgian anatomist, Andreas Vesalius in 1543 After performing a preliminary tracheotomy on a pig, he inserted a tube of reed or cane into the trachea, opened the thorax, and then applied artificial ventilation by blowing down the tube This proved to be a most advanced and skilful manoeuvre, for it was not until centuries later that its value as a means of maintaining pulmonary ventilation after thoracotomy was fully appreciated The next 200 years saw little further development in tracheal intubation, but by the end of that time, the need for more effective resuscitative measures was becoming increasingly obvious Mouth-to-mouth breathing had been performed as a resuscitative technique since biblical times, and in the early part of the sixteenth century, Paracelsus, a physician and lecturer of Basel, reported the recovery of a case of asphyxia with a bellows connected to a tube placed in the mouth of the patient It would appear that endotracheal intubation, as a means of resuscitation, was first performed in 1754, when Benjamin Pugh, a Chelmsford surgeon, designed an "air pipe" made from a coiled wire covered with soft leather The "air pipe was introduced orally into the trachea of an asphyxiated neonate by a tactile technique, the operator then blew down the tube intermittently It proved to be an effective method, although introduction of the pipe was difficult and usually traumatic Little further interest was shown in neonatal intubation during the next half-century, but in 1807 Chaussier, physician to the Maternite de Paris, produced a curved metal cannula which could be introduced into the trachea blindly, and again the operator insufflated the lungs of the neonate by blowing down the cannula intermittently —G M J White Evolution of Endotracheal and Endobronchial Intubation, *British Journal of Anaesthesia,* May, 1960 perature. By zeroing the larger dial through adjusting the smaller scale, one can determine at any moment the existing body temperature of the patient.

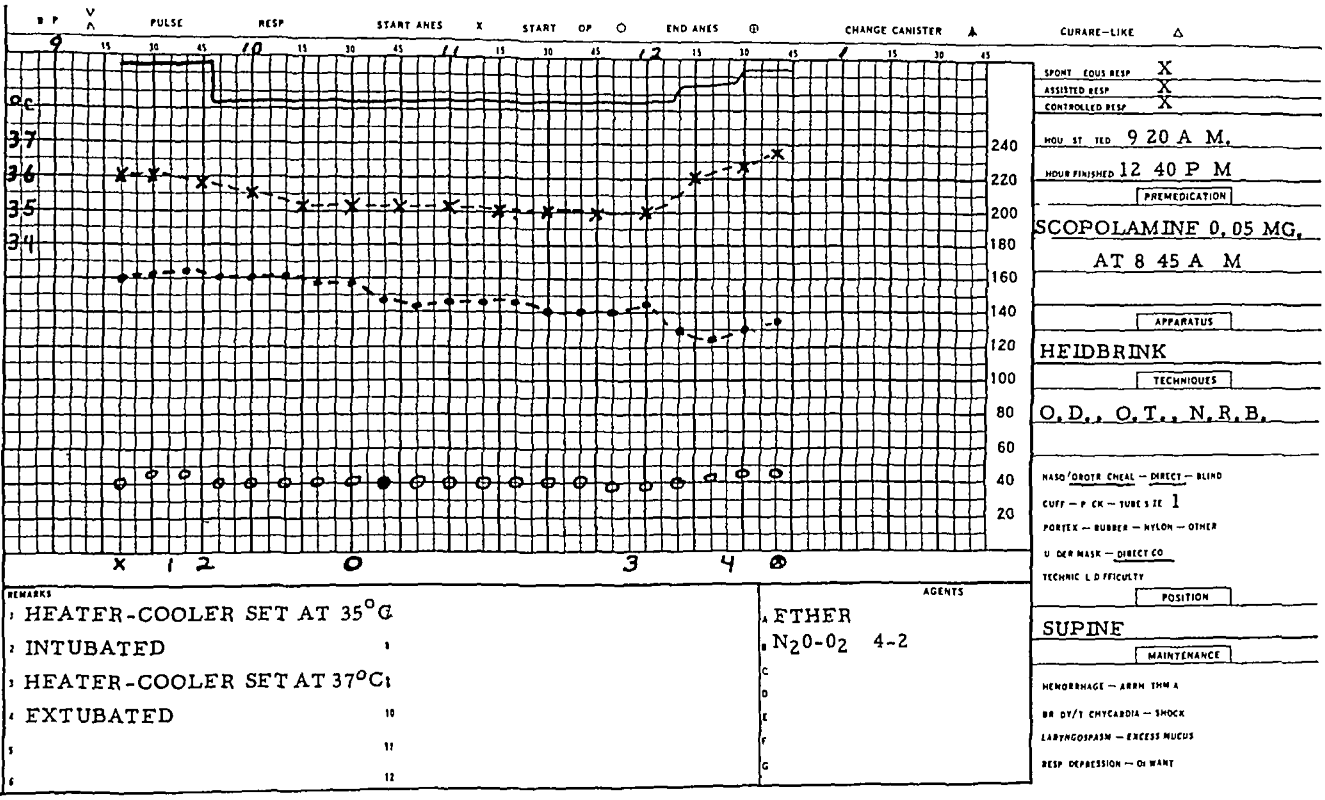
4. In the main body of the apparatus there is a heating unit and a refrigeration unit. These units are motivated automatically by signals from the electronic control so that warm water or cool water is circulated constantly through the plastic pads. If the pre-set temperature desired is lower than the body temperature of the patient, cold water will circulate through the pads, and vice-versa. As the body temperature approaches that desired, the temperature of the circulating water will be regulated accordingly. After the desired temperature has been reached, the apparatus will cycle automatically to circulate warm or cool fluid in an effort to stabilize the patient at the desired temperature. The temperature of the patient can be maintained automatically within ± 0.8°F of that pre-set by the physician. On the front of the apparatus is a needle dial which monitors continually the temperature of the circulating fluid.

5. The total liquid capacity of the combinations of pads used is not more than one quart. This comparatively small amount of water allows rapid changes in the temperature of the pads. A one-quart reservoir assures replacement of any fluid lost by evaporation, spilling or leakage.

6. There are two other dials on the front panel of the body of the apparatus which allows one to regulate manually the temperature extremes of the water circulating in the pads. Such regulation by the physician prevents the circulation of what he may consider too hot or too cold fluid. We have found by experience that, if during the rewarming period the temperature of the circulating fluid is greater than 108° F (42.2° C), burns are likely to be produced, particularly over pressure areas.

Figure 6 illustrates the employment of this apparatus in a 7-week-old infant who was subjected to a bilateral inguinal herniorrhaphy over a period of 200 minutes. Orotracheal, non-rebreathing nitrous oxide, oxygen, and ether were employed for anesthesia. Shortly after induction the heating-cooling unit was activated, with the temperature pre-set at 35°C. Within 30 minutes the body temperature of the infant had reached this level and was maintained there for 105 minutes. At this time the control dial was re-set to 37°C., and the body temperature of the infant began to rise immediately. At the end of the operative procedure, 40 minutes later, the rectal temperature was 36.8°C.

In over 300 infants and children up to the age of 10 years, we have found this apparatus to be reliable and consistent in operation. It permits stabilization of the body temperature at any desired level and it will induce moderate degrees of hypothermia or produce rewarming rapidly and effectively. It has been found valuable in controlling body temperature postoperatively and is most useful in warming patients whose body temperature has fallen inadvertently while in the operating room.



SPONTANEOUS RESP X
ASSISTED RESP X
CONTROLLED RESP X
HOUR STARTED 9 20 A M.
HOUR FINISHED 12 40 P M
PREMEDICATION
SCOPOLAMINE 0.05 MG.
AT 8 45 A M
APPARATUS
HEIDBRINK
TECHNIQUES
O.D., O.T., N.R.B.
POSITION
SUPINE
MAINTENANCE

REMARKS
1 HEATER-COOLER SET AT 35°C
2 INTUBATED
3 HEATER-COOLER SET AT 37°C
4 EXTUBATED

AGENTS
A ETHER
B N$_2$O-O$_2$ 4-2

Fig. 6.—Record of rectal temperature, pulse rate, and respiratory rate in 7-week-old infant who underwent bilateral inguinal herniorrhaphy. Note rectal temperature controlled at 35 C by automatic heating-cooling unit, with increase in temperature towards end of procedure by resetting apparatus.

of a "foot drop" at birth On the contrary, there was an average of 15 8 days before the "foot drop" was noted, despite the daily close observation of each child in the premature nursery The injected medicament was always an antibiotic of some sort, usually penicillin or streptomycin or both In the absence of other demonstrable causes, we concluded that the "foot drop' originated in an inadvertent injury to the sciatic nerve, either directly by the injecting needle, or by extravasation of the injected medicine into the nerve, or as the result of a "toxic reaction" occurring when large concentrations of medication are injected adjacent to a major peripheral nerve trunk Combes and Clark found that perisciatic gluteal injections of tetracycline, oxytetracycline, erythromycin and other agents caused sciatic nerve damage, whereas repeated saline injections or direct needling did not Their data suggests that nerve injury following intragluteal injection in the vicinity of the sciatic nerve may result from chemical irritation' as well as from constrictions of the nerve by scar tissue" In view of the small gluteal area, and the relative paucity of muscle covering the sciatic nerve, it is surprising that the accident does not occur more often when intragluteal injections are given to premature infants

TABLE 1 —Observations on Ten Premature Infants Who Showed Partial Denervation of Sciatic Distribution to Leg

Infant	Side	Muscle Function Elicited	Ankle Jerk*
1	R	Toe flexor posterior tibial toe extensors	0
2	R	Peroneal triceps surae posterior tibial	+
3	L	Posterior tibial toe flexors	0
4	L	Toe flexors triceps surae	0
	L	Triceps surae	+
6	R	None	0
7	R	None	0
	L	None	0
9	L	None	0
10	R	None	0

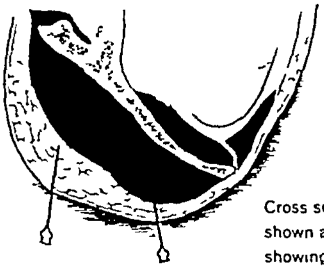
* + with 0 without

TABLE 2 —Chronaxy Determinations* Obtained on Seven Infants

Infant	Age at Time of Chronaxy	Common Peroneal Nerve Msec	Posterior Tibial Msec
6	2¼ yrs	0 5	0 4
4	21 days	3 0	10 0
	1 yr	0 2	
3	1½ yrs	0 2	
8	1½ yrs	0 3	
5	19 days	20 0	
1	10 days	4 0	
10	2½ yrs	0 4	

* Noted to be of limited value because of age cooperation and examination factors

There are a number of case reports in the literature of sciatic neuropathy developing following gluteal injections [2,4] A number of drugs have been implicated morphine, typhoid vaccine, bismuth, paraldehyde, and, of course, antibiotics, especially penicillin A particularly interesting group of cases are those reported following injection of drugs into the umbilical cord, inadvertently injecting the umbilical artery rather than the umbilical vein [5,6] Nikethamine (Coramine) or a similar agent (Cyclitron) was used, the nerve palsy being accompanied by a skin reaction in the involved buttock varying from edema to actual tissue slough The conclusion was tentatively reached, although experimental

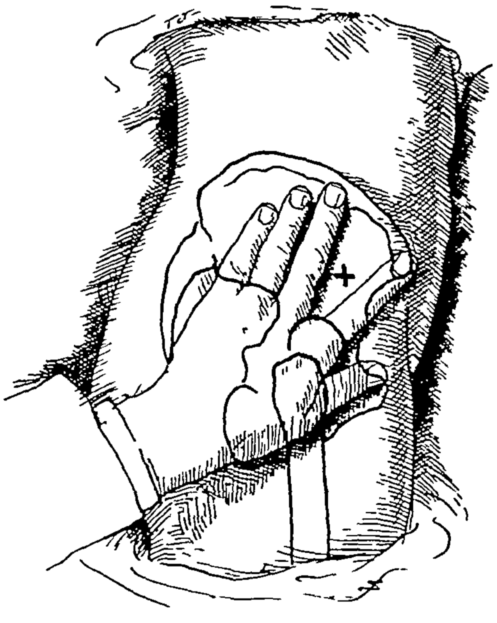


Cross section of hip shown at + on other drawing, showing relative injection sites

NEW INTRAMUSCULAR INJECTION TECHNIQUE

VENTROGLUTEAL VERSUS DORSO-INTRAGLUTEAL SITE

Based on a comparative study by
H K von Rechenberg and R Schmidt
Schweiz med Wchnschr 88 37 Jan 11 1958



Diagrammatic drawing of ventrogluteal injection site

Sciatic Palsy in Premature Infants

A Report and Follow-up Study of Ten Cases

Paul H Curtiss Jr , M D , and Howard J Tucker, M D , Cleveland

Ten premature infants with partial sciatic palsy were followed-up for an average period of three years and four months In all but one patient, recovery of a functional degree of dorsiflexion of the foot occurred in an average of four months Six patients developed a mild, easily correctable equinovarus deformity, and all but one showed 1 to 2 cm of shortening of the involved foot In the absence of other demonstrable causes, the authors concluded that the sciatic nerve lesion originated in an inadvertent injury by an injecting needle or from a neurotoxic effect of the agent injected The one constant finding in all cases was a history of intramuscular gluteal injections starting on the first day of birth The ventrogluteal injection site is safer as suggested than the traditional dorsogluteal site

WE HAVE HAD the opportunity of observing 10 premature infants who have shown partial denervation of the sciatic distribution to the leg All of these infants exhibited unilateral "foot drop" as the presenting symptom, with no other muscle weakness demonstrable above the knee Exact muscle testing by clinical means, admittedly, is impossible in the tiny premature infant, and any evaluation at all must depend on stimulation and observation (Table 1) In later infancy, a more accurate evaluation could be made, and chronaxy study was possible in 7 of the 10 cases

When functioning muscles were identified (with two exceptions), they were innervated by the medial branch (tibial nerve) of the sciatic nerve According to Sutherland,[1] "It is the experience of most observers that in injuries of the sciatic nerve, the lateral branch (common peroneal nerve) is more frequently involved and more often suffers greater damage than the medial" The reasons advanced for this are as follows The lateral popliteal division is placed more superficially than the medial, due to the fact that the sciatic is somewhat rotated The nerve fibers in the lateral division are of larger size and fewer in number and enclosed in a relatively smaller amount of connective tissue than the medial division The lateral division, furthermore, is fixed and angulated at the sciatic notch and neck of the fibula, whereas the medial division is less securely fixed and can absorb lateral displacement without injury

Etiology

All of the cases reported here occurred in premature infants, the youngest having a fetal age of 24 weeks, the oldest 37 weeks No mention has been found in the literature of an especially high incidence of sciatic nerve lesions in premature infants

Maternal Factors—As many variable factors in the mother's history as could be accurately documented were considered The age range was from 18 to 40 years, the average being 27 5 years Prenatal history, duration of labor, and anesthesia factors were classified as "variable" in these women The results of these investigations can be briefly summarized by saying that the only constant finding was the fact that, of the nine mothers whose blood type was recorded, all were Rh positive This was not felt to be statistically significant, as 85% of Caucasian women (three mothers), and 95% of Negroid women (seven mothers) are Rh positive

Fetal Factors—The information obtained concerning the immediate neonatal period of the infant was scrutinized carefully Considered were the fetal age, blood type, type of delivery, abnormalities noted at birth, injections at birth and gluteal injections in nursery starting at day of birth The one constant finding in all cases was intramuscular gluteal injections starting on the first day of birth The injections (alternating the right and left buttocks) were given for an average of 10 4 days, the shortest time being 3 days and the longest 36 days In none of the infants, however, was mention made

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From the Department of Surgery Division of Orthopaedic Surgery, and the Department of Medicine, Division of Neurology, Western Reserve University Medical School

Read before the Section on Orthopedic Surgery at the 109th Annual Meeting of the American Medical Association, Miami Beach June 15, 1960

Parenteral Fluid Therapy of Burns

Use of a Single Solution During First Forty-eight Hours

J Frederick Eagle Jr , M D , New York City, Worthington G Schenck Jr , M D ,
and Walton Shim, M D , Buffalo, N Y

A single intravenous solution containing 5% glucose, 0 66% sodium chloride, and 2% protein has been used for the parenteral fluid therapy of 28 patients with second- and third-degree burns involving 15% or more of the body surface area Only the rate of administration must be changed to accommodate the size of the patient and the extent of the burn Only one death occurred during the first 48 hours Because this solution replaces water, salt, and protein continuously at the same rates at which they are being lost from the circulation, it has theoretical advantages over other regimens which replace these factors discontinuously by alternate infusions of plasma, saline, or dextrose and water Its greatest value lies in the ease of management and the virtual absence of fluid and electrolyte problems

ALL FORMULAE for the administration of parenteral fluids to patients with extensive thermal burns provide for replacement of four materials water, protein, electrolytes, and red blood cells Usually four different solutions are used for this replacement, dextrose and water, plasma, 0 9% saline, and blood, and, except under circumstances where there are two or more intravenous set-ups, these solutions are administered one after the other

Ideally, these substances should be replaced at the same rate at which they are being lost We have used a single solution devised to satisfy the requirements of water, salt, and protein[1] and have found that its use is most satisfactory in patients who have marked differences in size and in the extent of their burns The solution contains 5% glucose, 0 66% sodium chloride, and 2% protein Only the rate of administration must be changed to accommodate the size of the patient and the extent of the burn

Derivation of Formula

The three burn formulae used most commonly in the United States were devised by Cope and Moore in 1947,[2] Evans in 1952,[3] and the Brooke Army Hospital group in 1953[4]

If we used these three formulae for the treatment of a 70-kg (154-lb) individual with a 25% burn, the following amounts of fluid, sodium chloride, and protein would be administered in a 48-hour period

Source of Formula	Fluid Ml	Electrolyte Gm NaCl	Protein Gm
Cope and Moore	8 624	47 6	196
Evans	8 250	44.2	182
Brooke group	8 251	44.2	91

It is apparent that the three formulae are very similar except for the protein content in the Brooke formula which is 50% of the other figures This lower protein content was arrived at partly because electrolyte solutions are much cheaper and can be secured in larger quantities in time of disaster

If the amounts of the various solutions used in the above formulae were combined into a single solution, Cope's formula would contain 0 55% saline and 2 2% protein, Evans' formula would contain 0 54% saline and 2 2% protein, and the Brooke formula 0 54% saline and 1 1% protein

Our solution contains 0 67% saline and 2% protein Its composition was based on a consideration of the composition of the above-mentioned formulae plus a consideration of the ease of making the solution with readily available material One unit of plasma mixed with one unit of 5% dextrose in water and one unit of 5% dextrose in saline achieves the desired concentrations of protein and electrolyte Or, if serum albumin is preferred, 2 Gm added to each 100 ml of a solution composed of two units of 5% dextrose and saline and one unit

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From St Luke's Hospital New York and the Edward J Meyer Memorial Hospital Buffalo proof is lacking, that there was a concentration of drug entering the inferior gluteal artery, with its subsequent thrombosis This vessel supplies the area of the sciatic nerve, the muscles, and the lower one-half of the skin in the gluteal area where the lesion occurs

Treatment

Treatment in all of our cases consisted of a removable light plaster or malleable metal posterior splint, holding the ankle at a 90-degree angle and the foot in a neutral position The splint was maintained until recovery occurred Six of the children developed mild equinovarus deformities of the involved foot These were all successfully corrected by serial plaster casts, with no residual deformity when last seen

Prognosis

One patient (Infant 5) died of pneumonia at 2 months of age The nine surviving children have been followed-up for an average of three years and four months, the longest follow-up being four years and two months, the shortest being one year and four months

Recovery of active dorsiflexion to a functional degree occurred in all but one child The average time before functional recovery was observed was 4 06 months, the shortest time being 1 5 months and the longest 7 0 months The one patient who has not recovered (Infant 9) has been followed for a period of four years, and no recovery is anticipated With one exception, the involved foot has varied from 1 to 2 cm shorter than the uninvolved side In the one exception (Infant 1), the recovery of function was the second most rapid (two months) of the observed cases

Chronaxy determinations were obtained on seven infants, but were found to be of limited value (Table 2) By reason of age, cooperation was necessarily limited, and examination was confined to the common peroneal and posterior tibial nerves Three patients had chronaxy determinations on discovery of the lesion shortly after birth, one of whom was re-examined at 1 year of age All chronaxy determinations done at birth showed impaired nerve function with elevated chronaxy In the one case examined both at birth and one year later, normal function and normal chronaxy was found on the second examination Four of the seven infants did not have chronaxy determinations at discovery of the lesion but were studied at varying periods of from one year to two and one-half years after birth At the time of this examination, all showed normal return of function, and were found to have normal chronaxy values

The results in our cases differ from those reported by Combes and others[8] in that in their study of 12 infants of various ages, only one showed a "good" recovery

Prevention

We think that this unfortunate accident could be avoided by an increased awareness of the hazards of dorsal gluteal injection, especially in the premature infant Von Rechenberg and Schmidt[7] have suggested the ventrogluteal injection site as advocated by von Hochstetter,[8] rather than the traditional dorsal gluteal site (see figure) They feel that this area offers, essentially, no danger of injection injury and insures actual intramuscular injection Another less hazardous site, which has been advocated by other authors, is the vastus lateralis

Summary

The occurrence of sciatic nerve injury in 10 premature infants following an intragluteal injection of medicament has been described In all but one patient, recovery of a functional degree of active dorsiflexion occurred in from 1 5 to 7 0 months (average, 4 06 months) Six patients developed a mild, easily correctable equinovarus deformity, and all but one showed from 1 to 2 cm shortening of the involved foot The ventrogluteal or vastus lateralis injection site is suggested as a preferable target for intramuscular injection, especially in the premature infant

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fluid intake during the first 48 hours are (1) 30 ml per square meter for each percentage point of body surface burned (up to 50%) to replace fluid lost through the wound, plus (2) an amount of fluid equal to 10% of the body weight in kilograms to account for edema accumulation, plus (3) 2,000 ml per square meter for insensible water loss, plus (4) 2 000 ml per square meter for adequate urinary output

One third of this fluid will usually be required in the first eight hours after the burn, and the initial rate of infusion should be adjusted to achieve this aim As soon as urinary output exceeds 40 ml per square meter per hour the rate of infusion should be decreased in the same way it is for adults For patients with burns of less than 15 to 20% of the body surface area, in whom edema is not a major factor, the fluid equal to 10% of the body weight in kilograms— (2) above—need not be given

Report of a Case

A 6 year-old girl was admitted to the hospital half an hour after setting fire to her clothes while playing with matches She had incurred an 80% body burn from the knees to the chin, most of which was third-degree She weighed 20 kg (44 lb) and her calculated surface area was 0 82 square meters An ankle vein was cannulated with a plastic catheter and 0 85% saline infusion was started until the burn solution was prepared The burns were pressure dressed and an indwelling catheter was inserted

The rate of infusion of the burn solution was calculated as follows (a 50% burn was assumed)

$$
\begin{aligned}
30\text{ ml} \times 50\% \times 0\ 82\text{ sq meter} &= 1{,}230\text{ ml for loss through burn site,}\\
20\text{ kg} \times 10\% &= 2{,}000\text{ ml for edema,}\\
2{,}000\text{ ml} \times 0\ 82\text{ sq meter} &= 1\ 640\text{ ml for insensible water loss,}\\
2{,}000\text{ ml} \times 0\ 82\text{ sq meter} &= 1{,}640\text{ ml for urine output,}\\
&\overline{\ 6\ 510\text{ ml total for 48 hours}\ }
\end{aligned}
$$

One third of this, or 2,170 ml , was to be given in the first eight hours, equivalent to an average hourly rate of 280 ml The urine output aimed at was 40 ml times 0 82 sq meters, or 32 ml per hour Therefore the calculated input-output ratio was 8 7

Table 2 shows the hourly and cumulative total input and the hourly and cumulative total output of urine and the ideal totals at 8, 24, and 48 hours The hematocrit and electrolyte values are also indicated

The actual input and ouput values at 8, 24 and 48 hours correspond well to the original estimate of requirements There was no evidence at any time of pulmonary edema As expected generalized edema did develop There is no means of preventing edema and at the same time providing adequate fluid to maintain blood volume Diuresis did not occur until 72 hours after the burn The parenteral fluid management during the first 48 hours was very easy to accomplish and was more than satisfactory As is wont to occur in such severe burns the patient suddenly died 18 days later for reasons which were not explained by our observations She was alert and eating well until two hours prior to death The burns were not extensively infected, and there was no bacteremia

TABLE 2 —Fluid Studies in Patient Treated with Single Solution*

Hours After Burn	Input Hourly	Input Total	Urine Output Hourly	Urine Output Total	Hematocrit	Na	Cl	CO₂
1								
2	200	200						
3	200	400						
4	200	600	30	30	37			
5	480	1 080	70	100				
6	200	1,280	7	107				
7	760	2 040	125	232				
8	380	2 420	60	292				
	Calculated	**2 170**	**Calculated**	**256**				
9	200	2 620	30	322	38			
10	150	2 770	40	362				
11	150	2,920	30	392				
12	200	3 120	32	424	37			
13	325	3 445	60	484				
14	175	3 620	10	494				
15	220	3 840	15	509				
16	180	4 020	90	599				
17	125	4 175	8	607	37			
18	225	4 370	65	672				
19	225	4 595	120	792				
20	150	4 745	45	837				
21	50	4 790	35	872				
22	100	4 890	15	887	34	144	106	24
23	125	5 015	26	913				
24	100	5 115	25	938				
	Calculated	**5,340**	**Calculated**	**768**				
25	225	225	45	45				
26	75	300	50	95				
27	75	375	30	125				
28	100	475	35	160	35			
29	25	500	30	190				
30		500	12	202				
31	105	605	20	222				
32	75	680	14	236				
33	215	895	29	265				
34	210	1 005	65	330				
35	125	1 130	55	385	30			
36	150	1 280	55	440				
37	125	1 405	73	513				
38			44	557				
39	60	1 465	50	607				
40	20	1 485	30	637				
41	60	1,545	18	655	33			
42	60	1 605	13	668				
43	100	1 705	23	691				
44	60	1 765	27	718				
45	3	1 768	3	721				
46	45	1 813	24	745				
47	40	1 853	13	758	35			
48	100	1 953	13	771				
	Calculated	**2 170**	**Calculated**	**768**				

Ideal totals shown in boldface at 8 24 and 48 hour

Results

This type of parenteral fluid therapy has been used exclusively for the management of all burned patients admitted to the Meyer Memorial Hospital, Buffalo, N Y , for the past six years and at St Luke s Hospital in New York City for the past four years

The staffs have been impressed by the ease of management and the virtual absence of fluid and electrolyte problems The fact that water, salt, and protein are being continually replaced in approximately the same proportions and at the same rate of 5% dextrose and water will achieve the same result.*

Whole blood has rarely been necessary during the first 48 hours, although its value after this period of time is unquestioned. This is not surprising since it has been shown that the red blood cell mass is rarely decreased more than 10% as a result of hemolysis and sludging.[5] Furthermore, the use of blood—particularly large quantities—makes it difficult to interpret hematocrit values and destroys the usefulness of this simple laboratory test.

Other aspects in the management of the severely burned patient are meticulously followed. An indwelling catheter is inserted to insure accurate measurement of urinary output. Venous cut-downs are performed as needed, with polyethylene tubes firmly sewed in place. Doctors, nurses, and attendants wear masks and gowns. Bedclothes are sterile. Antibiotics are used as indicated. Tracheostomy is performed where tracheal burns are suspected.

Rate of Administration

All formulae call for rapid administration of solution during the first eight hours after the burn, and decreasing rates thereafter. *At the end of the* second day, particular care must be taken to slow the rate of infusion, since fluid returning to the circulation from the extracellular spaces may overload the circulation and cause pulmonary edema. Ve follow the same general principles and our aiting rate for adults is 20 ml. per one percentage point of body surface burned per hour. If parenteral fluid administration is delayed for any reason, the hourly rate should be increased so that the patient will receive 160 ml. per percentage point of body burn in the first eight hours after the burn. This rate is used only until urinary output has become established, after which our infusion rate is adjusted to achieve a urinary output of 60 ml. per hour, or 1 ml. a minute.

A normal healthy adult will excrete about 60 ml. of urine an hour when his water intake from all sources averages 120 ml. an hour. If water intake *is decreased so much that* urine output falls below 10 ml. an hour, fluid and electrolyte homeostasis begins to fail. Likewise, if water intake increases to the point where 300 ml. of urine is being produced in an hour, the upper limit of renal homeostasis is also being approached. Therefore the fluid intake is adjusted in an attempt to achieve a urine output of 60 ml. an hour.

The intake of a healthy adult is normally twice the urinary output. However, in a patient with a 50% burn the intake must be 16.6 times the urinary output. Thus, the intake must be increased by 830% to achieve the same hourly urine output of 60 ml. per hour. The amounts of increase for lesser burns are shown in Table 1.

Table 1.—Correlation of Fluid Intake with Extent of Burn

Extent of Burn, %	Initial Rate of Infusion, Ml./Hr.	Desired Urine Output Ml./Hr.	Input/ Output
50	1,000	60	16.6
45	900	60	15.0
40	800	60	13.3
35	700	60	11.7
30	600	60	10.0
25	500	60	8.3
20	400	60	6.7

During the first 48 hours after the burn this ratio of intake to output will gradually fall to a normal ratio of two to one. At about 48 hours, when the capillaries begin to regain their integrity and the edema fluid is mobilized, subnormal ratios may and frequently do occur. At this point urinary output in excess of 60 ml. per hour may occur, although little or no intravenous fluid is administered.

After an adequate urinary output has been obtained, ideally during the first two or three hours, urinary output will increase unless the rate of the infusion is decreased. In our experience, the hourly infusion rate should be decreased by 60 ml. an hour whenever the urinary output exceeds 60 ml. an hour.

For example, in a patient with a 45% burn the starting hourly infusion rate should be 900 ml. per hour (see Table 1), provided the infusion is started shortly after the patient is burned. This infusion rate is 15 times the desired urinary output. Under such circumstances urinary output may well approach 60 ml. an hour within the first three hours. When urinary output exceeds 60 ml. per hour the ratio of input to output should be decreased from 15 to 14, which is the same as saying that the rate of infusion should be decreased 60 ml. per hour.

A useful technique to dramatize the importance of urinary output is to save the hourly specimens. They should be placed in a row in chronological order so all who take care of the patient can readily see them. A glance at these bottles will give even the inexperienced a good idea of how the patient is doing with respect to water balance.

Calculations for Children or Small Adults

For children or adults weighing less than 100 lb. (45.4 kg.) greater accuracy is needed and the calculations are accordingly more complicated. It is necessary to calculate the surface area of the infant either by the following formula:

$$\text{Surface area} = \sqrt[3]{(\text{weight, kg.})^2} \times 0.1$$

or from a standard nomogram. The calculations for

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*A closed system is used for preparing this solution. The tops of three empty 1,000 ml. vacuum bottles are sterilized with iodine and alcohol, as is one 1,000-ml. bottle of plasma, one 1,000-ml. bottle of 5% dextrose and water and one bottle of 5% dextrose and saline. One end of a blood donor set is inserted in the bottle of plasma and the other end consecutively into the vacuum bottles until 333 ml. has been transferred to each bottle. This procedure is repeated with the 5% dextrose and water and the 5% dextrose and saline. Should the vacuum be lost in any bottle before these maneuvers can be completed it will be necessary to use a vacuum pump. For this reason it is advisable to mix this burn solution in a blood bank where such equipment is usually available.

Quantitative Bacteriuria after Use of Indwelling Catheters

Incidence in Genito-urinary Surgery

B. G. Clarke, M.D. and Sumner Joress, M.S., Boston

THE counting of bacteria in urine has become recognized, especially during the past two decades[1] as a very useful and highly reliable test for urinary infection. Bacterial counts of 1,000 or less per ml of urine seldom are associated with infection and appear to result from normal urethral flora or contamination.[2] Counts of more than 10,000[3] and certainly of more than 100,000[3-6] are indicative of infection. Urine specimens with bacterial counts of this order may be expected to show micro organisms in the stained sediment in about 80 per cent of cases.[4-7] Data yielded by this method of culture from specimens collected by urethral catheterization may be expected to agree with 95[7] to 96[8] per cent of specimens obtained by midstream voiding. Similarly high agreement occurs when bacterial counts on urine collected by voiding or catheterization are compared with counts on urine aspirated from the bladder by suprapubic needle puncture.[8,9]

By means of quantitative urine cultures it has been shown that a single urethral catheterization can result in significant bacteriuria in 2 per cent of females.[10] Multiple catheterizations have caused bacteriuria in 3 per cent of adult ambulatory subjects. After 24 hours an indwelling urethral catheter resulted in bacteriuria in 50 per cent of patients, and after 4 days, in 98 to 100 per cent.[7] One of the mechanisms of "catheter bacteriuria" appears to be the propagation of organisms in the film of exudate between catheter and urethra.[11] Significant bacteriuria was found in 25 per cent of patients one year after use of indwelling urethral catheters during convalescence from gynecologic operations.[10]

The present study of 78 patients was made to ascertain in what proportion significant bacteriuria persisted after use of an indwelling urethral catheter for urinary diversion during convalescence from presumably successful operations for bladder cancers, bladder stones, and prostatic obstructions. Since surgically traumatized tissue, as well as urine, offers an excellent culture medium for bacterial growth, the conditions of the study are considered to present a particularly severe test of the potential harmfulness of the indwelling urethral catheter.

To ascertain the incidence of catheter-induced bacteriuria persisting after convalescence from urological operations, quantitative urine cultures were made three months or more after 78 operations (for prostatic obstruction, bladder tumors, or bladder stones) requiring indwelling catheters for two or seven days after operation. Only one patient showed quantitatively significant bacteriuria. In 24 of the patients the infection cleared up spontaneously. Antibacterial medication had been given to 23 patients while in the hospital, and 31 patients, including the one in whom infection persisted, received antibiotics afterward. Catheter bacteriuria does not necessarily persist after genito urinary operations, provided factors favoring infection, such as stones and obstructions, are removed and provided patients are persistently observed to make sure that infections which do not disappear spontaneously are adequately treated.

Materials and Methods

Seventy-eight male patients, whose ages at the time of surgery ranged from 15 to 81 years (fig 1, *left*), were studied retrospectively at periods of three months to five and one-half years (fig 1, *right*) after operations performed by me. Twenty

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Associate Professor of Urology and Head of Division Tufts University School of Medicine and Chief of Urology New England Center Hospital and Boston Dispensary (Dr Clarke) and Chief Bacteriologist New England Center Hospital (Mr Joress)

Read before the American College of Surgeons Sectional Meeting and the New England Section American Urological Association Boston March 2 1960

patients had undergone transurethral electroresection of bladder tumors, after which a urethral catheter had been left in place, on the average, for two days Thirty-one patients had undergone transurethral electroresection of the prostate (including three who had simultaneous tumor resection and one who had simultaneous litholapaxy), after which a catheter was left indwelling *usually for four days* Twenty-three patients underwent suprapubic prostatectomy (one with simultaneous hemicystectomy for tumor and two with simultaneous cystolithotomy), after which the urethral catheter was usually left in place for seven days Four patients underwent perineal prostatectomy (one had a radical operation for cancer), after which a urethral catheter remained in place usually for a week One of the patients was diabetic The blood urea nitrogen level was normal, preoperatively, in each case Pyelograms made before operation were normal for all patients but one, who had mild bilateral ureterectasis before and nine months after operation

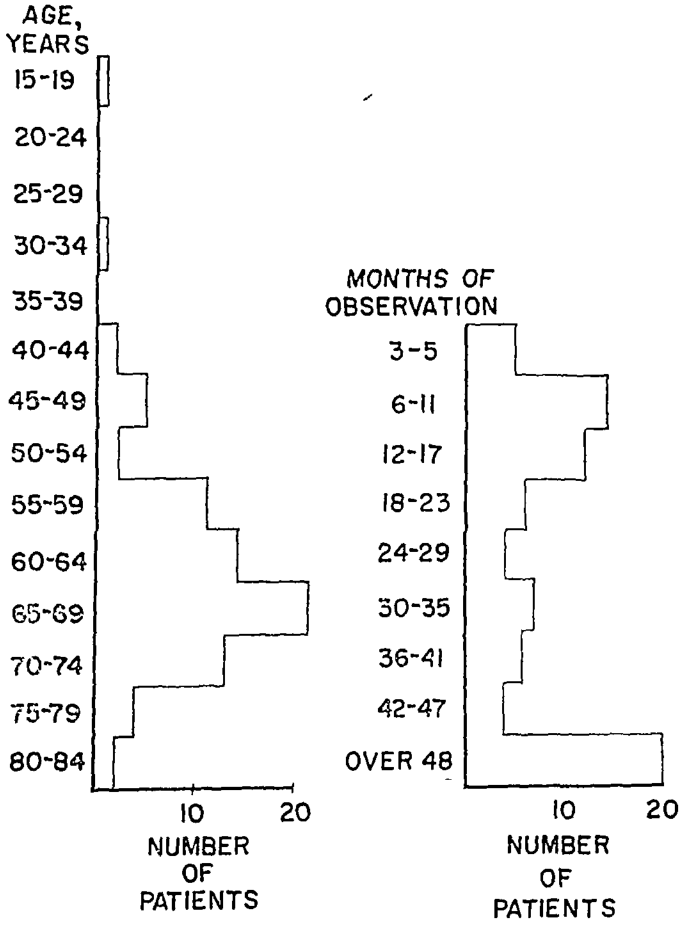

Fig 1 —*Left*, distribution of patients' ages *Right*, number of months between operation and final quantitative urine cultures

Prior to operation urine cultures had not been collected systematically During the period of indwelling urethral catheterization all patients showed py[illegible] cultures were not made in every[illegible] itse[illegible] reason to believe that [illegible] play its usual preva-

During hospitalization 23 patients were antibacterial agents, chiefly for prophylaxis a a few cases, for clinically apparent acute infec After they left the hospital they were obs periodically until the usual criteria of a satisfa postoperative result were apparent During period 31 individuals, some of whom had also *antibacterial* drugs while in the hospital, given antibacterial agents In some cases prop laxis was indicated In others, the agents w administered *to control* symptoms of cystitis dur the first few weeks after operation In still oth the urine examinations failed to return to nor within the two or three months during which epithelization of the bladder and urethra usua takes place[12], medication was prescribed on th account A few patients received antibiotics f treatment of unrelated infections occurring els where in the body after their urinary operation To the best of the writer's knowledge, 24 patient had received no antibacterial treatment from the time of the operation until the time of the study

In January and February, 1960, *letters* were written to the patients who had undergone operations of the types enumerated above, requesting that they return for interview, urinalysis, and quantitative cultures of the urine All patients were included in the study who could return and whose records were complete These criteria were met by 78 patients, all of whom reported that they felt well and that they voided normally *For* the study, urine specimens were collected from each patient by midstream voiding into sterile containers after aseptic preparation of the glans penis with 1 1,000 aqueous solution of benzalkonium chloride, the specimens were delivered immediately to the laboratory, and urinalyses *were performed by stand* ard methods Quantitative urine cultures were made under the direction of the junior author by a method which *is based on standard* technics of enumerating bacteria in milk and water, as follows 0 1 ml of urine is added to 100 ml of sterile saline solution, this dilution is shaken and a 1 0-ml aliquot added to a tube (15 ml) of melted agar at 45° C, 0 2 ml of sterile sheep's blood is added and *the tube is shaken and poured* into a sterile Petri dish, colonies are counted at the end of 24 hours of incubation at 37° C , the number of colonies in *the Petri dish is multiplied* by 1,000 (the dilution factor) to give the number of bacteria per ml of urine

Results

Quantitative urine cultures were negative for infection in 77 *of the* 78 patients No growth appeared in 26 of the final cultures, and less than 1,000 organisms occurred per ml of urine in 51 The distribution of bacteriologic findings appears in the table and figure 2

The patient with persistent bacteriuria and pyuria was a 59 year-old man who had been treated for chronic prostatitis for two years before suprapubic prostatectomy Cystoscopic and pyelographic studies before and nine months after operation yielded findings consistent with persistent infection, associated with mild bilateral ureterectasis of congenital type, in the presence of otherwise satisfactory operative results

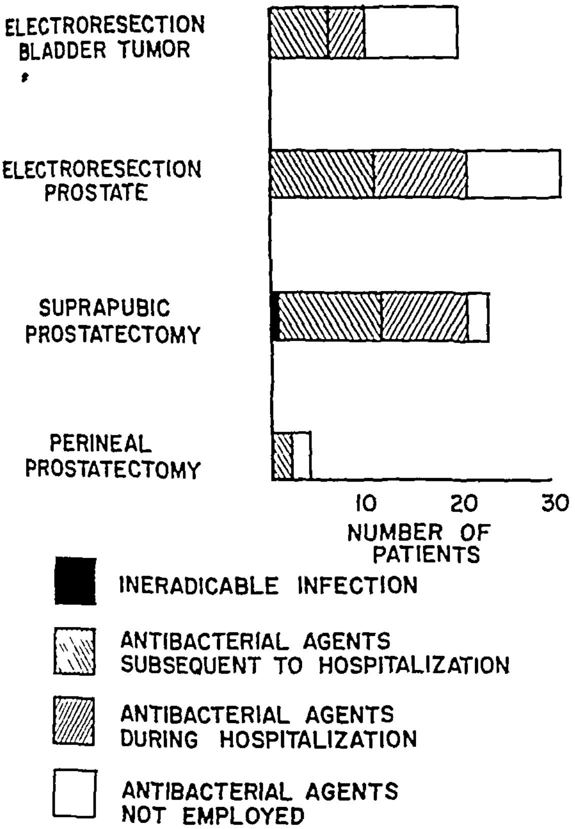

Fig 2—Operations, postoperative treatments, and results

Pyuria (over 5 white blood cells per high-power field of centrifuged sediment) was observed at the time of study in 11 patients, variable degrees of proteinuria were found in 9 Seventy-eight per cent of patients with histologically proven pyelonephritis may show pyuria and 65 per cent may show proteinuria[8] Since, with one exception, these abnormalities were not associated with quantitative bacteriuria in the present study, they probably reflect other types of renal disease in this rather elderly (fig 1) group of patients

Comment

The strikingly low incidence of persistent bacteriuria, pyuria, and proteinuria in this study requires explanation The bacteriologic method is considered reliable and has been used 50,000 times at the New England Center Hospital since 1954, with highly reproducible results in essential agreement with those of others[3,5] There is no reason to doubt the validity of the general relationships already cited[5,7,10,11] between urethral catheterization and bacteriuria It is also evident that although acute pyelonephritis is usually easily diagnosed, and curable in as many as 90 per cent[13] of cases, chronic pyelonephritis may be destructive, hard to recognize clinically or with the aid of the laboratory, difficult to classify histologically, and attended by low cure rates with or without the use of antibiotics

An important consideration would appear to be that not all patients with bacteria in the bladder necessarily develop pyelonephritis, although microorganisms can reach the kidneys from the bladder through the circulating blood, the lumen of the ureter, the ureteral tunica propria, or the lymphatics For example, among 40 patients studied at autopsy and found to have more than 100,000 bacteria per ml of bladder urine, only 14 had histologic evidence of pyelonephritis[14] In a clinical study[15] of 60 paraplegics who had indwelling urethral catheters for periods of 1 to 14 years, 43 had no clinical evidence of renal disease and 41 had normal pyelograms It may therefore be reasonable to suppose that not all patients with catheter bacteriuria will necessarily have persistent infections

A second consideration is that urinary obstruction is known clinically and experimentally to favor persistent urinary infection In the present study, although catheters were required during convalescence, the operations resulted in removal of obstructions and other factors known to be associated with persistent infection

Types of Operation and Results

Operation	No of Patients	Antibacterial Medication*	Urinary Bacteria/Cc 0	<1 000	>1 000	Pyuria >5 WBC/HPF	Albuminuria
Electroresection bladder tumor	6	After	2	4		1	1
	4	During	2	2		1	
	10	None	5	5		2	
Total	20						
Electroresection prostate	11	After	6	5		1	
	10	During	3	7		3	2
	10	None	2	8			
Total	31†						
Suprapubic prostatectomy	12	After	2	9	1	3	3
	9	During	2	7			
	2	None	1	1			1
Total	23‡						
Perineal prostatectomy	2	After		2			1
		During					
	2	None	1	1			1
Total	4§						

* Terms during and after refer to period of hospitalization

† Group includes three patients who underwent simultaneous electroresection of tumor and one who underwent simultaneous litholapaxy

‡ Group includes one patient who underwent simultaneous hemicystectomy for tumor and two who underwent simultaneous cystolithotomy

§ Group includes one patient who underwent radical perineal prostatovesiculectomy for cancer

The third consideration, which is probably material in the results of the present study, is that the progress of all the patients had been closely followed postoperatively and none was discharged from observation until he voided normally and had apparently clear urine The necessity for prolonged observation and persistent treatment of urinary infections has repeatedly been emphasized

The present study does not permit statistical evaluation of the efficacy of prophylactic administration of antibacterial agents in the presence of indwelling urethral catheters Their use did not seem to result in persistent drug-resistant infections or in development of superinfections, nor, on the other hand, did their non-use have any discernible adverse effect

Summary

Seventy-eight patients were subjected to indwelling urethral catheterization for periods of two to seven days after surgical operations for the removal of bladder tumors, bladder stones, and prostatic obstructions Twenty-four patients received no antibacterial medication, 23 were given antibacterials while in the hospital, and 31 were given antibacterial drugs after departure from the hospital At periods of three months to five and a half years after operation, significant bacteriuria, with counts of over 1,000 micro-organisms per ml of urine, persisted in only one patient

The data suggest that "catheter bacteriuria" does not necessarily persist after genito-urinary operations provided (1) that factors favoring infection, such as obstructions, tumors, or stones, can be removed and (2) that patients are observed persistently, to assure that bacteriuria not disappearing spontaneously is adequately treated

171 Harrison Ave (11)

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BLADDER STONE —It is likely I inherited the gravel from my father, for he died sadly afflicted by a large stone in the bladder He did not become aware of the disease until his sixty-seventh year Before that, he felt neither menace nor pain in his reins, sides, or elsewhere He had lived in robust health and seldom subject to illness Then, for seven years he endured this affliction, painfully dragging out the end of his days I was born twenty-five years or more before the disease appeared, when he was in his prime—the third of his children in order of birth While he was still so remote from disease, how could the light trifle of his substance out of which he built me convey so deep an impress? And how could it have remained so hidden that I did not perceive it until forty-five years later? Moreover, I am the only child among many brothers and sisters born of one mother that was ever troubled with it Where could the propensity have been brooding all this while? The doctor who can satisfy me on this point I'll believe as many miracles of as he pleases, provided he does not give me—as they usually do—a theory more intricate and fantastic than the thing itself —M Lowenthal Autobiography of Michel de Montaigne, Cambridge, Mass , Houghton Mifflin Company, The Riverside Press, 1935

Hospitalized Patients with Staphylococcus aureus in the Intestine

William H Dearing M D and Gerald M Needham Ph D, Rochester, Minn

This study of 243 hospitalized patients with Staphylococcus aureus in the intestine revealed that the symptoms produced by this organism may vary from mild to severe and may disappear with or without specific antibiotic therapy designed to eliminate the organism itself Staphylococcic enteritis was more likely to occur among postoperative patients who had received antibiotics capable of altering the intestinal bacteria The same type of Staphylococcus aureus can exist in the intestine and in other sites of the body at the same time It was noted recently that Staphylococcus aureus isolated from the patient was more and more prone to exhibit resistance to neomycin and to bacitracin, posing problems in preparation of the intestine for operation Staphylococcic enteritis is readily reversible, while pseudomembranous enterocolitis is usually but not always fatal, regardless of therapy

THE purposes of this study among 243 consecutive, hospitalized patients who had *Staphylococcus aureus* in the intestine in varying numbers were to determine (1) whether these microorganisms were related to clinical symptoms and signs exhibited by the patients, (2) whether antibiotic administration contributed significantly to the development of staphylococcic enteritis, (3) whether these patients would recover from the staphylococcic enteritis with or without specific antistaphylococcic antibiotics, (4) whether phage typing of the *Staph aureus* would shed any light on any possible epidemiologic factors, (5) whether patterns of resistance of *Staph aureus* to various antibiotics would contribute anything to our knowledge of staphylococcic enteritis, (6) whether *Staph aureus* in the intestine produced pathologically a recognizable enteritis among patients who died of causes other than staphylococcic enteritis, and finally (7) whether pseudomembranous enterocolitis, with or without *Staph aureus* in the intestine at necropsy, could be correlated definitely with clinical staphylococcic enteritis

Many investigators have shown that coagulase-positive, antibiotic-resistant strains of *Staph aureus* in relatively large numbers may produce mild to severe clinical enteritis [1-8] and that the enteritis is usually readily reversible with appropriate antibiotic management [6, 9] Likewise, it has been demonstrated that pseudomembranous enterocolitis is always a serious disease [3, 10-12] which is not satisfactorily controlled by any known method of treatment, including the administration of antibiotics

In some of our cases included in a previous study,[6] Surgalla and Dack [13] showed that the *Staph aureus* isolated from these patients contained potent enterotoxins Bennett and associates [14] reported staphylococcic enteritis in epidemic form occurring among chinchillas Prohaska [15] demonstrated that strains of *Staph aureus* that were enterotoxin producers and that were isolated from patients with pseudomembranous enterocolitis could produce experimentally intestinal lesions in chinchillas that had previously been given antibiotics orally Furthermore, he showed that orally administered staphylococcal enterotoxins could produce intestinal lesions in chinchillas without previous antibiotic therapy Some of the extensive literature on antibiotic therapy in staphylococcal disease is summarized in a monograph by Welch and Finland [16]

Methods

Clinical Aspects—Every patient in whom staphylococcic enteritis was suspected and the stool cultures revealed the presence of *Staph aureus* in a two-year period, from April 1, 1958, to March 31, 1960, inclusive, was included in this study, although it was arbitrarily required that these patients be

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From the Mayo Clinic and Mayo Foundation The Mayo Foundation is a part of the Graduate School of the University of Minnesota

Read before the Section on Gastroenterology and Proctology at the 109th Annual Meeting of the American Medical Association Miami Beach June 15 1960 hospitalized for 24 hours or longer before they were eligible for inclusion

In order to facilitate presentation and establish a rather rough guide as to the intensity of symptoms and signs attributable to *Staph aureus* in the intestine, the following classification was adopted (1) mild—those patients with three to five bowel movements per 24 hours, with or without mild distention of the abdomen, nausea or low-grade fever (2) moderate—those patients with 6 to 10 stools per day plus definite distention of the abdomen, nausea, occasional vomiting, or increased output of enteric contents in those patients with intestinal intubation, fever, excessive fatigue and exhaustion, and (3) severe—those patients with numerous liquid bowel movements per day plus nausea, vomiting, profuse flow of enteric contents in those patients with intestinal intubation, abdominal distention, fever, exhaustion and, in some instances, varying degrees of mental confusion and even mild degrees of shock

It should be pointed out that in postoperative patients with various serious complications (such as pneumonia and peritonitis) it is impossible to assay signs and symptoms attributable to staphylococcic enteritis This is a source of error in our study that cannot be avoided There were also hospitalized patients who had *Staph aureus* in the intestine and who had diseases that made it difficult to assay the role of *Staphylococcus* in producing symptoms These diseases were chronic ulcerative colitis and regional enteritis, and hence patients with these diseases were catalogued as "unclassified" in our clinical appraisal of the various symptoms attributable to *Staph aureus*

TABLE 1 —Patients Who Had Staph aureus in the Intestine and Recovered Without Any Specific Antibiotic Therapy for the Intestinal Staph aureus

Symptoms or Signs	No of Cases
Not significant	3
Mild	58
Moderate	5
Severe	0
Unclassified (patients with chronic ulcerative colitis or regional enteritis)	6
Total	72

In the main, the following doses of antibiotics were employed orally four times daily erythromycin, 250 to 500 mg, novobiocin, 250 to 500 mg, bacitracin, 5,000 to 20,000 units, vancomycin, 250 to 500 mg, oleandomycin, 250 to 500 mg, and neomycin, 1,000 mg

The antibiotic preoperative preparation of the intestine over a period of one and one-half days consisted of oral administration according to one of the following programs (1) 1 Gm of neomycin and 0 25 Gm of tetracycline every hour for four doses the first day and then 1 5 Gm of neomycin plus 0 25 Gm of tetracycline four times daily the second day, or (2) neomycin, 1 Gm every hour for four doses the first day and then 1 5 Gm four times daily the second day

When bacitracin was used prophylactically in the postoperative period soon after an intestinal operation, the oral dose was 5,000 to 20,000 units four times daily

Bacteriologic Aspects—Bacteriologic examinations were made from fresh diarrheal fecal material, tissue or swabs obtained from lesions, moistened and transported in 1 ml of nutrient broth to the laboratory

All material except feces was cultured on the following media nutrient agar containing blood, eosin methylene blue (Levine), approximately 16 ml of dextrose brain broth contained in a tall tube, and a nutrient agar plate containing phenylethyl alcohol Phenylethyl alcohol-containing medium is particularly suited to specimens likely to contain large numbers of gram-negative bacilli, especially of the Proteus group Staphylococci grow uninhibited on phenylethyl alcohol-containing medium and may be easily isolated for further study and identification Bacteriologic identification of *Staphylococcus* was made in the usual manner with coagulase-positive strains identified as *Staph aureus*

Susceptibility of the organisms to various antibacterial agents was determined from pure cultures of freshly isolated strains Antibiotics in varying concentrations were incorporated in solid medium and susceptibility was determined by inoculating fresh young cultures on the medium and incubating and observing the plates for the presence or absence of growth

The procedure for the bacteriophage typing of staphylococci is based upon the recommendations of the subcommittee on Bacteriophage Typing of Staphylococci, of the International Committee on Bacteriological Nomenclature Twenty-four phages were used for routine typing

Pathologic Aspects—In those patients who died with suspected pseudomembranous enterocolitis or staphylococcic enteritis, carefully isolated segments of unopened jejunum, ileum or colon were tied off and sent to the bacteriologic laboratory where the contents were removed without contamination and cultured in accordance with methods described above

In pseudomembranous enterocolitis, when the bowel was opened, large quantities of gas and liquid feces escaped from the lumen The mucosal surface of the intestine was covered with yellow-green or tan-colored sticky pseudomembrane which varied in extent from that of small scattered plaques to that of a diffuse process extending for distances of several feet along the intestine

Microscopic examination of the intestine revealed the pseudomembrane to consist of a mixture of necrotic cellular debris, fibrin, a variable number of inflammatory cells, and mucus, all of which covered an ulcerated mucosal surface The details of these changes have been described fully elsewhere[12]

Results

Table 1 illustrates that patients may have *Staph aureus* in the intestine and yet recover from the associated staphylococcic enteritis without the administration of any antistaphylococcal antibiotics—circumstances that agree with those long recognized in staphylococcic enteritis following the ingestion of food contaminated with *Staph aureus*

Table 2 summarizes a series of 135 patients who had *Staph aureus* in the stools and who recovered (that is, there was a disappearance of *Staph aureus* from the intestine or of symptoms attributable to these microorganisms or of both) following the administration of various antibiotics designed to eliminate *Staph aureus* from the intestine

Table 3 records the antibiotics used to control *Staph aureus* in the intestine among the patients in this study Erythromycin, by agreement, has been reserved for use in patients with *Staph aureus* sensitive to this antibiotic, hence the greater use of this agent in our study

When one analyzes the information on the 243 patients in this study according to rough estimates of the relative numbers of *Staph aureus* in intestinal cultures, it is found that in 34 patients this microorganism in the cultures was present in small numbers along with the usual intestinal flora, while in 168 patients it was present in large numbers along with the usual intestinal flora All of the 34 patients with *Staph aureus* present in small numbers in the cultures from the intestine exhibited either no significant symptoms or only mild symptoms and signs attributable to the staphylococci On the contrary, the 168 patients with *Staph aureus* present in large numbers in the intestinal cultures along with the usual intestinal flora presented a wide gamut of signs and symptoms varying from minimal to severe There were also 21 patients in this study who had *Staph aureus* present in the intestine in pure culture without any other intestinal bacteria, yet three of these recovered from staphylococcic enteritis without any specific antibiotic therapy, while 16 recovered with the use of antistaphylococcal antibiotics Two of the 21 patients died of causes unrelated to the presence of intestinal staphylococci

TABLE 2 —Patients Who Had Staph aureus in the Intestine and Recovered After Specific Antibiotic Therapy for the Staph aureus

Symptoms or Signs	No of Cases
Not significant	6
Mild	96
Moderate	20
Severe	10
Unclassified (chronic ulcerative colitis regional enteritis or ileal stoma)	3
Total	135

The following surgical fields were represented among 183 patients who had *Staph aureus* postoperatively in the intestine minor surgery, 5 patients, general surgery, 30 patients, intestinal surgery, 104 patients, biliary-tract and pancreatic surgery, 12 patients, esophageal and gastric surgery, 23 patients, and abdominal exploration, 9 patients It is evident that intestinal operations constituted the largest group This group received in a routine manner oral neomycin plus oral tetracycline preoperatively Of the 104 patients operated on for intestinal lesions of various types, 69 received oral neomycin plus oral tetracycline preoperatively (operations performed by 12 different surgeons), while 35 received oral neomycin alone preoperatively (operations performed by four different surgeons)

TABLE 3 —Summary of Antibiotics Administered Orally for Intestinal Staph aureus (All Patients Recovered)

Antibiotic	No of Cases
Erythromycin	44
Novobiocin	7
Erythromycin and novobiocin	10
Neomycin	3
Erythromycin and bacitracin	19
Novobiocin and bacitracin	2
Bacitracin	15
Erythromycin novobiocin and vancomycin	4
Oleandomycin	3
Various combinations of 2 or more	28
Total	135

Sixty-eight patients who had *Staph aureus* in the intestinal tract following various types of operations had not received antibiotics preoperatively, symptoms or signs were not significant in 5 of these, mild in 29, moderate in 21, and severe in 13 In three cases of peritonitis the symptoms and signs were not classifiable in relation to the intestinal staphylococci

On the contrary, 62 patients who had *Staph aureus* in the intestine had no surgical operations of any kind (Twenty-seven of the 62 patients had no antibiotics at any time)

In each of the 243 cases, studies of the resistance of the intestinal *Staph aureus* to erythromycin, novobiocin and bacitracin were made from April 1, 1958, through March 31, 1960 It was evident from these investigations that when antibiotics that are effective against staphylococci are used extensively among our hospitalized patients, the incidence of resistant *Staph aureus* increases For example, the intestinal *Staph aureus* was sensitive to bacitracin during 1958, but when this antibiotic was used routinely by some of our surgeons in the postoperative period of patients who had undergone intestinal operations, the incidence of resistant strain to *Staph aureus* rose from 0 per cent during the first quarter of the year 1959 to 4 per cent during the second quarter of this year and finally to 50 per cent in the third quarter As the routine use of this antibiotic was discontinued in the fall of 1959, the incidence of resistance of the intestinal *Staph aureus* declined to 32 per cent in the fourth quarter of 1959 and finally to 11 per cent during the first quarter of 1960 The same circumstances occurred with novobiocin, which was used more extensively to treat staphylococcal disease in late 1959 and early 1960, as indicated in the illustration To erythromycin, however, which has been used selectively in staphylococcal disease, a fairly uniform incidence of resistance has been maintained during the two-year period of this study, both as regards intestinal *Staph aureus* and as regards *Staph aureus* from multiple sources in hospitalized patients in our institutions

TABLE 4 —Summary of Phage Typing of Intestinal Staph aureus Among 198 Patients

Type	Patients, Total	Patients with Same Type of Staph aureus Elsewhere* as in Intestine
No type	129	33
80/81	11	6
53/77	10	7
52/52A/80/81	4	2
VA4	1	1
187	1	1
7/47/54/70/73/75/VA4	1	1
7/42E/47/53/54/73/77/VA4	1	1
29/52/52A/80/81/7	1	1
47/53/54/75/83	1	1
No type and 80/81	2	2
77	4	0
53	2	0
7/77/83	2	0
7/47/53/54/73/75/77/VA4	2	0
Miscellaneous types	26	0
Total	198	56

* In wound, nose throat, sputum, skin urine or blood

It has been noted from time to time that a strain of *Staph aureus* was resistant to neomycin, and during late 1959 and early 1960, it was observed that such strains were being isolated more and more frequently In February, 1960, one of us (G M N) reviewed the incidence of resistant *Staph aureus* from all sources from patients and noted that 25 per cent of the strains were resistant to erythromycin, 27 per cent to novobiocin, 7 per cent to bacitracin and 17 per cent to neomycin Six of the 17 strains resistant to neomycin were from the intestinal tract

Table 4 gives the results of phage typing of the intestinal *Staph aureus* in 198 of the 243 patients It is evident that the majority of these were in the no-type category and that among the 129 patients with no-type *Staph aureus* in the intestine there were 33 patients with no-type *Staph aureus* situated in other tissues or fluids of the body (wound, nose, throat, sputum, skin, urine, or blood) Of the 11 patients with type 80/81 in the intestine, 6 had 80/81 in other tissues of the body, and of 10 patients with type 53/77 in the intestine, 7 had the same type also in other tissues of the body In all, if one includes the no-type as a group, 56 of the 198 patients had either the same type or a no-type *Staph aureus* in other parts of the body as well as in the intestinal contents

The last group of data to be presented concerns patients who died among the 243 who had *Staph aureus* in the intestine The most prominent question is whether patients with staphylococcic enteritis actually die of this disease or whether pseudomembranous *enterocolitis, with or without Staph aureus* in the intestine, must intervene to produce death Thirty-six patients in the series of 243 died, 21 of these had postmortem examinations which permitted both pathologic studies of the intestinal mucosa and cultures of the bowel contents

Among the 21 patients, two died of pseudomembranous enterocolitis which was present at necropsy But the *Staph aureus* that existed clinically was removed by antibiotic therapy and no *Staph aureus* was cultured from the intestine at postmortem examination Four patients who died of pseudomembranous enterocolitis (proved at necropsy) had *Staph aureus* in the intestine at postmortem examination Clinically, these organisms were not removed by antibiotic therapy In each of the four cases, *Staph aureus* isolated from the intestine clinically and at necropsy was classified as a no-type phage

One patient who died of causes other than pseudomembranous enterocolitis or staphylococcic enteritis had *Staph aureus* clinically and received antibiotic therapy for it, but this organism was not cultured from the intestine at necropsy Pathologic changes indicative of enteritis were not present at necropsy On the contrary, five patients who died of causes other than pseudomembranous enterocolitis or staphylococcic enteritis had *Staph aureus* clinically and received antibiotic therapy for this organism, yet *Staph aureus* was present in the intestine in large numbers at necropsy without any pathologic evidence of enteritis These findings suggest that *Staph aureus* may be present in the intestine in large numbers and produce clinically staphylococcic enteritis without any actual lesion being demonstrable in the intestine—certainly without any evidence of pseudomembranous enterocolitis which in our experience is always accompanied by pathologic changes in the bowel

Finally, nine patients who died of causes other than staphylococcic enteritis or pseudomembranous enterocolitis had *Staph aureus* clinically and at necropsy without any evidence of enteritis demonstrable at necropsy

Causes of death other than pseudomembranous enterocolitis included pulmonary embolism, peritonitis, pneumonia and myocardial infarction

Fifteen patients in this series who died did not have postmortem examinations, hence they cannot be included in the investigations we are pursuing in this study

Comment

It is evident from this study that patients may have *Staph aureus* in the intestine in small or large numbers along with the usual intestinal flora, or even in pure cultures, and yet recover from their symptoms without antistaphylococcal antibiotic therapy The observations made do indicate that appropriate antibiotics will usually eliminate *Staph aureus* from the intestine and bring about prompt cessation of symptoms or signs attributable to its presence there However, in very ill patients with vomiting and marked ileus, it is sometimes difficult to introduce antistaphylococcal antibiotics into the intestinal tract, and hence efforts to eliminate *Staph aureus* from the intestine by therapy are handicapped

Staphylococcal enteritis or staphylococcal diarrhea among our hospitalized patients is a source of concern to us, since we do not know its exact relation to potentially fatal pseudomembranous enterocolitis, to the possible role of intestinal staphylococci in serving as a reservoir for staphylococcic infection of other patients in our hospitals, or to the transfer of these intestinal organisms to other parts of the body where their presence may present serious problems, such as wound infections, pneumonia and septicemia However, our study does show that in our hospitals the presence of *Staph aureus* in the intestine in sufficient numbers to produce symptoms, although potentially serious, is usually a readily reversible disease with or without the administration of specific antistaphylococcic antibiotics In our series there were no deaths that could be attributed definitely to simple staphylococcic enteritis alone We could find no pathologic changes in the intestine of those patients who had staphylococcic enteritis clinically and bacteriologically but who died of causes other than staphylococcic enteritis (such as acute myocardial infarction or pulmonary embolism), even though coagulase-positive *Staph aureus* was present in large numbers in the intestine at necropsy These statements are not applicable to pseudomembranous enteritis, with or without *Staph aureus* in the intestine Pseudomembranous enterocolitis is usually a lethal disease and is always associated with pathologic changes in the intestinal tract The exact role of *Staph aureus* in human pseudomembranous enterocolitis remains to be determined If it is related to staphylococcic enterotoxins, as Surgalla and Dack[13] and Prohaska[15] believe, and staphylococcic enteritis is a precursor of the more serious pseudomembranous enterocolitis in patients with potent enterotoxin-producing *Staph aureus*, then some of our findings in patients with pseudomembranous enterocolitis can be explained, but at the present time we lack satisfactory laboratory tests to determine whether *Staph aureus* in a given patient is an enterotoxin producer, and, if so, how potent the toxin is which is produced The biologic tests on kittens and monkeys are not precise or specific enough for clinical use

It should be pointed out that the 243 cases in this series did not present at any time any features suggesting an epidemic, but rather, bring into focus the fact that symptomatic intestinal infections with *Staph aureus* occur periodically among our hospitalized patients, in spite of current efforts to isolate patients with staphylococcic disease, to remove carriers of resistant strains of *Staph aureus* from contact with patients, and to utilize many other measures designed to reduce the incidence of staphylococcal infection

The routine determination of sensitivity of *Staph aureus* to various antibiotics and of phage type, as we are now doing, may prove useful in studies of drug-resistant staphylococci in our hospitals For example, it is evident from this study that *Staph aureus* is becoming more and more frequently resistant to oral bacitracin and oral neomycin These findings pose a problem, for the first time in recent years, in the antibiotic preparation of the intestine for surgical procedures Staphylococcal diarrhea is not infrequent among patients prepared with neomycin or neomycin plus tetracycline, and some of the cases are probably related to neomycin-resistant strains of *Staph aureus* The latter statement must be proved by more intensive studies which are now under way

In routine phage typing of *Staph aureus* from the intestine it is noted that of 129 patients with no-type *Staph aureus* in the intestine, 33 also had no-type *Staph aureus* in other parts of the body, such as the surgical wound, blood, urine, nose or sputum, that of 11 patients with type 80/81 in the intestine, 6 also had the same type in other parts of the body, and that of 10 patients with type 73/77 in the intestine, 7 also had the same type in other sites of the body In short, of 198 patients with a given type of *Staph aureus* in the stool, 23 also had the same type in other sites of the body If one includes the 33 patients with no-type *Staph aureus* in other tissues of the body as well as in the intestine (which may or may not be justified), the last mentioned figure (23) becomes 56 (or 28 3 per cent) Because of the methods employed in this study, no conclusion can be drawn from these figures, but future investigations may show whether there is a relationship between intestinal *Staphylococcus* and *Staphylococcus* in other parts of the body, or even among patients harboring staphylococcal infection in our hospitals—especially if an epidemic of staphylococcal infections were to develop

Summary and Conclusions

The observations made and conclusions drawn from a study of 243 consecutive, hospitalized patients who had *Staphylococcus aureus* in the intestine are summarized as follows

1 *Staphylococcus aureus* may exist in the intestine of hospitalized patients and produce symptoms varying from minimal to quite severe The number of microorganisms of this type present in the intestine is an important factor in the symptomatology, but apparently other contributing factors also affect the intensity of symptoms exhibited by these patients One of these factors is probably the ability of *Staph aureus* to elaborate enterotoxins

2 Staphylococcic enteritis may subside without the administration of specific antistaphylococcic antibiotics, although the use of specific antibiotics may hasten disappearance of *Staph aureus* from the intestine and likewise may relieve the symptoms produced by this organism

3 *Staphylococcus aureus* is more likely to exist in the intestine and produce symptoms in surgical patients than in nonsurgical patients, but it is evident from this study that staphylococcal diarrhea may occur in patients who have not had an operation or who have not even received antibiotic therapy of any type

4 Among surgical patients, staphylococcic enteritis is more likely to occur in patients who have received preoperative antibiotic therapy which is capable of altering the intestinal flora than in patients who have not received such therapy

5 Intestinal *Staph aureus* exhibits the same trends of sensitivity to antibiotics as does *Staph aureus* isolated from other sites of the body It is significant to note that in recent months strains isolated from the intestine are more and more frequently exhibiting resistance to neomycin and to bacitracin This may present a real problem in preoperative preparation of the intestine for surgical procedures

6 Phage typing in this limited study has not permitted any significant conclusions, but it has shown that the same type of *Staph aureus* may exist not infrequently in the intestine and in other sites of the body at the same time

7 Staphylococcic enteritis may be mild or severe and not produce any postmortem evidence of pathologic changes in the patients who die of causes other than staphylococcic enteritis, even though *Staph aureus* be present in the intestine at the time of postmortem examination

8 We have not observed a patient in whom we could say that staphylococcic enteritis was the sole cause of death This disease is usually readily reversible by appropriate antibiotic therapy

9 Pseudomembranous enterocolitis, with or without *Staph aureus* in the intestine, is usually fatal It is always, in our experience, accompanied by demonstrable pathologic changes in the intestine at necropsy The relationship of *Staph aureus* to human pseudomembranous enterocolitis is still uncertain A reliable laboratory method of detecting and measuring staphylococcic enterotoxins would be helpful in studying further this relationship in patients

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Triacetyloleandomycin with Triple Sulfa

Its Role in the Control of Staphylococcus and Streptococcus Infections in the Urinary Tract

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Effects of treatment were studied in 277 patients with infections of the urinary tract, 113 of these infections being either staphylococcic or streptococcic. The treatment consisted of the oral administration of two tablets each containing triacetyloleandomycin, 75 mg, sulfadiazine, 111 mg, sulfamerazine 111 mg, and sulfamethazine, 111 mg, thrice daily for five days. The choice of drugs was intended to decrease the likelihood of difficulty with drug-resistant mutations and was based on evidence that tests of sensitivity of infecting organisms to sulfa drugs in vitro are not reliable in predicting therapeutic effectiveness. Of 86 patients who had staphylococcus infections, 64 (74%) recovered. Of 27 patients with streptococcus infections 17 (63%) recovered. Six patients developed a rash or diarrhea as side effects, but these were not sufficiently severe to necessitate interruption of the treatment.

DEVELOPMENT and spread of resistant coccal organisms to epidemic proportion is a constant threat today. Prevention of an alarming increase in this type of infection in urologic diseases depends on three major factors: observance of meticulous aseptic technique in the cystoscopic room and at the bedside, recognition and removal of the obstructive lesions in the urinary tract, and intelligent application of recently developed antimicrobial agents.

The war between man and microbe continues at a fast pace. The quality seen in nature of the ability of an organism to adapt itself to its environment, munificent as it is, does become meretricious when observed in microbes. After the widespread use of penicillin 90 per cent of staphylococcus infections became resistant to penicillin. Erythromycin, originally effective against staphylococcal infections in 90 per cent, is now only 20 per cent effective in areas where it has been recently used. Novobiocin has met the same fate. It was this that caused us to study triacetyloleandomycin in combination with triple sulfa, a combination of a newly developed antibiotic with a chemotherapeutic agent.

Triacetyloleandomycin

Favorable reports were made by Pan, Delahunt, Kaiser, and Bajek[1] on the study of triacetyloleandomycin in experimental rats and by Isenberg and Karelitz on studies in children. Particularly impressive was this study of laboratory susceptibility testing by English and Fink,[2] who reported the drug ‘was indicated in therapy in 78 per cent of the 64 antibiotic resistant epidemic staphylococci. In contrast, chloramphenicol is active against 52 per cent. Erythromycin was active against only 25 per cent, and penicillin against only 3 per cent. Here, then, may be a drug to help prevent spread of staphylococcus in epidemic form if early resistance to it can be prevented.

Originally opposed to drug combinations, recent work reported by basic scientists studying viral and microbial mutation has caused the profession to take a second look, recognizing the value of certain combinations. M R Pollock, of the National Institute for Medical Research, London,[3] states, "The frequency of emergence of drug-resistant mutants will be greatly decreased by the simultaneous use of two unrelated antibiotics since gene mutations occur independently of each other, and the chances of double mutation (toward resistance against two drugs) occurring in the same cell will be extremely rare."

In Tatum's[4] study on microbial genetics and antibiotics it is stated that the therapeutic use of massive doses of antibiotics to reduce the number of bacteria which by mutation could develop resistance is a direct consequence of the application of genetic concepts. So is the increasing use for therapeutic

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From the St Louis University School of Medicine.

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purposes of two antibiotics in combination, resistance to both of them would require the simultaneous mutation of two independent characters Kiefer goes so far as to state that erythromycin, penicillin, and streptomycin should only be given in combination and never alone because of their great tendency to develop resistant strains

TABLE 1 —Results of Treatment with Triacetyloleandomycin in 163 Patients and Streptococcus Infections

Disorder	Patients, No	Improved No	Improved %	Not Improved No	Not Improved %
Cystitis	60	42	70	18	30
Urethrocystitis	50	45	90	5	10
Pyelonephritis	10	7	70	3	30
Cystitis after transurethral resection	14	6	42	8	57 1
Prostatitis	17	9	52	8	47 1
Paraplegia in patients with indwelling catheters	4	2	50	2	50
Wound infections	6	4	66 6	2	33 4
Ureterovaginal fistula and furuncles of vulva	2	1	50	1	50
Totals	163	116	71 2	47	28 8

It is therefore becoming apparent that the use of a combination of drugs is justified, the chief objective being to prevent development of resistance It would seem that this combination of triacetyloleandomycin with triple sulfonamide, two different chemicals designed to attack the same group of organisms, is well justified

Clinical Study

All patients having staphylococcus and streptococcus infections in the urinary tract were included in this study Urinalyses and cultures were made in this study before, during, and after treatment The cultures were taken before, at the conclusion of, and one week after the treatment Two tablets, each one containing triacetyloleandomycin, 75 mg , sulfadiazine, 111 mg , sulfamerazine, 111 mg , and sulfamethazine, 111 mg , were given by mouth three times daily for five days

TABLE 2 —Data in Eighty Six Patients with Staphylococcus Infections Treated with Triacetyloleandomycin

Disorder	Patients, No	Improved No	Improved %	Not Improved No	Not Improved %
Urethrocystitis	57	47	83 4	10	16 6
Pyelonephritis	7	7	100	0	0
Cystitis after transurethral resection	10	2	20	8	80
Prostatitis	6	3	50	3	50
Paraplegia in patients with indwelling catheters	2	2	100	0	0
Wound infections	2	2	100	0	0
Various	2	1	50	1	50
Totals	86	64	74 4	22	25 6

Sensitivity Tests—Sensitivity tests were made on triple sulfa in the early part of the study but were abandoned since the correlation of the sensitivity tests for the triple sulfa was found to be at marked variance with the clinical findings, and it was noted that other reliable workers came to the same conclusions For example, Bert Leming,[5] head of the microbiology department of the University of Tennessee, made the following statement "Patterns of the sulfonamides have been presented, even though they are erroneous and misleading We use this group to reiterate that there is no accurate method known at this time of determining true sulfonamide sensitivity Therefore, we must rely on authoritative clinical trials as a guide for therapy"

Kiser, Beyer, and Young[6] concluded as follows "Clinical effectiveness of the drug (sulfadimethoxine) could not be correlated with bacterial sensitivity using high concentration sulfadimethoxine discs on various media This procedure was abandoned after 75 consecutive cases failed to demonstrate accurate correlation" This also was the finding of Leff and associates[7] and Draper and associates This observation, made by reliable clinical and laboratory investigators, is not fully appreciated by the practicing profession and should be given greater dissemination

TABLE 3 —Data in Twenty Seven Patients with Streptococcus Infections Treated with Triacetyloleandomycin

Disorder	Patients, No	Improved No	Improved %	Not Improved No	Not Improved %
Urethrocystitis	18	12	66 6	6	33 4
Cystitis after transurethral resection	4	4	100		
Cystitis in patients with atonic bladders	1			1	100
Prostatitis	3	1	66 7	2	33 3
Paraplegic cystitis	1			1	100
Totals	27	17	62 9	10	37 1

This study also included examination of blood for any dyscrasias, renal function tests such as those for the blood urea nitrogen level and urea clearance, and observations to find untoward symptoms The usual examinations and corrective measures were carried out as indicated on all patients with urinary infections in this group

Clinical Results—The clinical value of a drug is very difficult to evaluate numerically because of the many variables in the patient's condition which have a bearing on the results However, certain over-all conclusions are valuable

Of the 273 patients included in the study, 113 had staphylococcus or streptococcus infections, 86 of these recovered, as was manifested by regression of symptoms, clearing of the urine, and the fact that urine tests, microscopically and culturally, showed negative results Of the 86 patients who had staphylococcus infections, 64, or 74 4 per cent, recovered (Table 2) Of the 27 patients with streptococcus infections, 17, or 62 9 per cent, recovered (Table 3) The breakdown according to the diagnosis is indicated in Table 1

Six patients showed some mild side reactions manifested by a rash or diarrhea None of the symptoms were sufficient to cause the drug to be withheld Development of resistance was not observed in any of the clinical cases

Conclusions

From this study it seems that the administration of triacetyloleandomycin with trisulfonamide is a valuable addition to drug therapy in combatting these staphylococcus and streptococcus infections and will help prevent the development of resistant strains This study stresses the fact that the sensitivity tests for sulfonamides cannot be depended upon as an indication of clinical results, since there was very little correlation in this study in the findings in vitro and in vivo The triacetyloleandomycin observations in vitro were of greater significance, however

No development of resistance was observed, and theoretically this combination of two chemically different drugs, both effective against coccal infections, has a distinct place in prevention of coccal resistant organisms

The clinical results of a study of 113 coccal infections in which 86 patients recovered demonstrates its value in this type of infection Many patients in this group had types of genitourinary lesions in which the infections are difficult to eliminate, such as paraplegics and patients with indwelling catheters Many of these responded favorably

The lack of side reactions and toxic effects indicates the drug to be useful in chronic cases such as pyelonephritis in patients with chronic prostatitis This combination can be given for a long period Rapid absorption when it is given by mouth makes it easily administered

The triacetyloleandomycin used in this study was supplied as Tiomid by J B Roerig & Company New York

The laboratory work was performed by the Clinical Pathological Laboratory of St Louis and the Microbiological Laboratory of Desloge Hospital and St John s Hospital St Louis

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BACTERIAL CONJUGATION —In addition to their well-known advantages of easy culture, small size, and rapid reproduction, some bacteria possess novel mechanisms for exchanging and recombining genetic material One of these is *Escherichia coli,* in which conjugation was discovered in 1946 by Lederberg & Tatum It is a remarkable process, the understanding of which has involved the efforts of many investigators There are donor and recipient strains of *E coli* Individual cells usually contain two, three, or perhaps more nuclei, each of which includes a single chromosome, and ordinarily all nuclei are genetically identical Under suitable conditions donor and recipient cells conjugate pairwise A delicate conjugation tube forms between the partners Through this the chromosome of one nucleus of the donor cell migrates always head first, in a manner much like a rope being pushed or pulled from one box to another through a short connecting pipe The migration is slow, requiring some 2 hrs for completion During this interval, the partners often break apart, with the result that only a part of the donor chromosome enters the recipient This amazing process makes it possible to determine gene order in bacterial chromosomes in at least three ways With several gene differences between recipient and donor, linear arrangement of genes can be inferred in the usual way from relative recombination frequencies Artificial interruption of the mating process, e g in a Waring blender, at known times, reveals the order and spacing of genes from head to tail with remarkable precision —G W Beadle, Physiological Aspects of Genetics, *Annual Review of Physiology,* vol 22, 1960

On Specialization and Gastroenterology

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MEDICINE, throughout its long history, has been characterized by an unceasing and extraordinary degree of self-examination These analyses have taken various forms, as in the ancient dialogues of Socrates [1] or in the ubiquitous presidential orations of modern times Approximately 20 of the 40 papers read by chairmen before the Section on Gastroenterology and Proctology of the American Medical Association since 1917 have been of this type This presentation, in accord with tradition, considers specialization in medicine with particular reference to gastroenterology

Early and Modern Specialization

Specialization in medicine is as old as mankind It attained unusal proportions in the ancient civilizations of Egypt, Babylon, Arabia, China, Greece and Rome,[2] and among the primitive American Indians [3] A funeral inscription in Gizeh, ca 2500 B C , refers to a court physician, Irj, as "palace eye physician, physician of the belly and guardian of the anus "[4] Among the Pueblo Indians, the Snake Society "caused and cured" swelling of the abdomen, and the Mamzrau Society, deafness [3] These examples, appearing absurd today, reflect the ignorant ritualistic practices of those early times when the priest also was physician and, obviously, are not to be compared with the medical specialization of today According to Castiglioni,[5] "modern" specialization may have originated in the seventeenth century In Europe, it dates to the beginning, and in America, to the middle of the nineteenth century Important initial factors in the development of specialization have been society's increasing recognition of special skills and knowledge, individual intellectual urge, the desire for economic reward and prestige, and the steady accumulation of scientific information

The continued development of specialization is a direct outcome of the phenomenal expansion of medical and scientific knowledge No matter how justifiable the enthusiasm for the devotion of the "old-time" practitioner may be, one physician no longer can remain informed on all aspects of medicine The responsible practitioner, to provide adequate "total care," today must depend upon specialists, as the progress of medicine in the United States has indicated

> A renewed and productive interest has developed in disorders of the digestive system Gastroenterology today offers unparalleled opportunities for comprehensive clinical activity and for significant research In gastroenterology the science and the art of medicine are indivisibly combined Gastroenterologic diseases encompass many problems of internal medicine and important aspects of surgery The well-trained gastroenterologist must acquire knowledge of other disciplines in addition to his own He must combine a broad technical knowledge with a responsible, humane attitude toward people His work can never be a narrow specialty, for it is too clearly related to many other important fields of medicine

Opposition to Specialization

From its origin, specialization evoked powerful and curiously vituperative opposition Two thousand years ago, Plato [6] is said to have remarked "and this is the reason why the cure of many diseases is unknown to the physicians of Helos, because they are ignorant of the whole which ought to be studied, also, for the part can never be well unless the whole is well for this is the great error of our day, that physicians separate the soul from the body "—remarks not wholly unfamiliar to physicians of the mid-twentieth century Others, curiously, limit the abilities of the specialist to adeptness in special techniques Rosen [7] explains the hostility to specialization on the basis of reactions implicit in all group behavior "Innovations in medical activity, just as in other forms of human behavior, arouse resentment, because they upset established ways of thought and action, and disrupt stable relationships, in short, the mores of the group " MacCormick [8] writes "Being old fashioned, I fear that specialization is having, or is likely to have, several disadvantages or unfortunate results

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From the Department of Medicine, University of Chicago

Chairman's Address, Section on Gastroenterology and Proctology, the 109th Annual Meeting of the American Medical Association, Miami Beach, June 15, 1960 in medical education and general practice. I fear we are witnessing the passing of the general physician.”

This development should not be surprising. With the growth of scientific knowledge, the improved efficiency of medical service, and the greater mobility of doctors and patients, the character of general practice has changed. Many diseases, formerly dealt with only by persevering empirical care, now respond promptly to specific therapeutic measures. More patients with serious or undiagnosed illnesses are hospitalized. The complicated problems usually require physicians with special training and experience. While this trend has been criticized as the fragmentation of medicine, critics should realize that medicine no longer is a unidimensional activity involving only a patient and a physician. When skills other than his own are necessary, the physician must accept the responsibility of securing appropriate assistance. To meet this need, at least in part, general practitioners are developing comprehensive educational programs of their own. This pattern of a medical redevelopment will further reduce the numbers of the “old-style” family doctor—once required to deal with everything related to health—in favor of a modern personal physician, probably an internist, with sufficiently broad training, experience, and perspective to integrate the total medical care or the patient effectively. The modern general practitioner already has been identified with the internist.[9,10] There is, nevertheless, continued need for the dedication to medicine that is so characteristic of the “old-time” doctor. As in all activities today, there are “clock watchers” in medicine also, whose net contribution hardly approximates that of the devoted family doctor, despite his limited resources. It is at such medical dilettantes, not the specialist, that critical attention might be directed. But perhaps the fault is not entirely theirs, for may they not be the products of our time? Characterized, perhaps, by materialism rather than idealism and by conforming mediocrity rather than by the objectives of excellence and accomplishment?

Humanitarianism in Specialization

A major allegation against specialization has been the lack of a humane, sympathetic attitude, in favor of an impersonal, albeit technically skillful approach to the patient. This criticism is pertinent to some doctors, both practitioners and specialists, and, perhaps, to some medical centers more concerned with teaching and research, but its general application is not warranted, and its use to explain the current ills of medical practice is an unjustified oversimplification of a complex problem. Most physicians recognize the importance of the total clinical appraisal, though this approach may seem less essential for a surgeon removing a bunion than for an internist.

Humaneness in the care of the sick is not the exclusive property of any particular group, despite the tendency to arbitrarily ascribe this virtue to the general practitioner and to deny it to the specialist. Humaneness in medicine is a quality of character—a responsible interest in people, an intuitive sense of identification with the patient, and a dedication to the ideals of medicine—perhaps a product of both early personal development and personality. Academic activities, per se, probably never create genuine interest in the patient where none existed before. Nor is there a rationale for the assumption that the increasing knowledge and experience of specialization automatically diminish the interest of the physician in the welfare of the patient. As Atchley[11] has indicated “No warm person is frozen by research experience, nor is a cold, tactless person thawed by general practice.” Despite the many nonmedical personnel now necessarily involved in clinical care, effective personal relationships between doctor and patient can be established and maintained, the key to the matter is the personality of the individual physician, not necessarily his function as a specialist or a general practitioner.

Specialization in Gastroenterology

Competent medical care requires knowledge and skill, as well as interest in the patient. In this important area, the specialist in internal medicine possesses obvious advantages: thorough training, experience with difficult problems, and increased awareness of the possible significance of clinical events. Specialization will continue, for it is the most effective means of utilizing the vast output of biological and medical research for the benefit of the patient. Today, no physician, specialist or practitioner, can achieve complete independence in the comprehensive care of the sick. The solution of the problem is not a limitation of specialization but its careful development on a broad, stable base, its coordination with other specialties, and its proper integration in the practice of medicine.

Gastroenterology is uniquely endowed with many of the qualities of a comprehensive medical specialty. Gastroenterologic diseases encompass many problems of internal medicine and important aspects of surgery. Numerous digestive illnesses reflect the effects of emotional disturbances upon gastrointestinal function, requiring skill in the recognition and management of nervous disorders and an interest in the personal problems of the patient. The well-trained gastroenterologist must acquire knowledge of other disciplines, in addition to his own, and he must have some understanding of the basic sciences.

Evolution of Gastroenterology as a Specialty

As a distinct medical activity, gastroenterology probably dates to antiquity.[12] According to Garrison,[13] "gastroenterology is probably the oldest phase of internal medicine, dissociated at the start from supernatural (speculative) causes" Long before the domestication of animals, and before the Egyptian pyramids, man had "experimented" with digestive problems, learning, for example, that camomile and dandelion were laxatives, and that certain earths, perhaps the sources of bismuth and kaolin, controlled diarrhea Two of the earliest medical documents, the Ebers Papyrus, ca 2000 B C, and the Caraka Samhita, an ancient medical compendium from India, contain numerous references to digestive disorders, including hepatic disease, intestinal parasites and malabsorption

Of course, the initial important advances, as in other fields, came later—in gastroenterology, perhaps with DeGraaf (1664), R de Réaumur (1750), and Spallanzani (1780) Gastroenterology achieved status in France with the studies of Claude Bernard and in England with the observations of Sir Henry Holland in approximately 1858 [14] It gained momentum in Germany under the leadership of Kussmaul in 1869, aided by Leube, Ewald, Boas, Billroth, and Wolfler, among others, and elsewhere, by the classic observations of Pavlov, Beaumont, W B Cannon, Carlson, Frank Mann, and many others Boas apparently was the first to specialize in the practice of gastroenterology, about 1886, originated the first clinic, and in 1896 founded the first periodical in gastroenterology The American Gastroenterological Association was founded in 1897 (the German Gastroenterological Society was established in 1914) The Section on Gastroenterology and Proctology of the American Medical Association was organized in 1916, and held its first meeting in 1917

The formalization of gastroenterology in the United States was not greeted with enthusiasm In 1904, Meltzer[15] responded "the aim of our association is, and shall be, to bring together all the solid scientific workers in the United States who contribute to a knowledge of the normal and pathological conditions of the gastrointestinal canal And there is ample justification for such a union Many of the most characteristic anatomical, physiological and pathological features of the digestive canal are common to all of its parts" White[16] later expressed similar views "we have not tried to develop narrow stomach specialists, but rather to bring together all the solid scientific workers in the United States and Canada who are interested in diseases of the digestive organs Our work can never be a narrow specialty, it is too clearly related to many important fields of medicine"

Present Status of Gastroenterologic Knowledge

What is the status of gastroenterology as a specialty? What have been its accomplishments and its limitations, and what should be its objectives?

In the care of the patient, gastroenterology, like other specialties, has profited from the significant general advances in medicine during the past 50 years Important technological progress has been achieved, including endoscopic and biopsy techniques and roentgenologic procedures, exfoliative cytologic examinations, and ingenious surgical procedures Newer studies of gastrointestinal secretory activity, hepatic disease, malabsorption, and other intestinal disorders are slowly extending the scientific frontiers of gastroenterology

Nevertheless, the major problems remain unsolved, and there continue to be divergent opinions on the nature and treatment of most digestive diseases At least three factors may be involved One is the practice of gastroenterology by inadequately trained physicians and poorly-informed internists, whose superficial approach approximates the "peaceful mediocrity" of earlier ages As a result, gastroenterology remains permeated by empiricism, dogma, and misguided therapy These imperfections can be dispelled only by improved training and by more critical teaching and thinking

A second factor is the need for more fundamental knowledge in this field Despite the research activity of the past, and the investigations now in progress, knowledge of the digestive tract remains insufficient The study of gastroenterologic problems is complicated numerous variables are involved, and quantitative measurements often have been lacking Modern scientific advances have produced many techniques appropriate to this purpose, such as tissue culture, histochemistry, isotopic analysis, immunological approaches, and enzyme biochemistry, but these await utilization Opportunities for clinical and laboratory investigation in gastroenterology are unsurpassed Gastritis, peptic ulcer, polyps, cancer, regional enteritis, ulcerative colitis, malabsorption, viral hepatitis, and hepatic disease are some of the clinical problems awaiting solution The geographic distribution of gastrointestinal disease, genetic, environmental, hormonal, and neurogenic factors in digestive disorders, the effects of aging upon gastrointestinal function, mechanisms of gastric secretion, the nature of tissue resistance, the biological changes involved in psychogenic disorders, enzyme systems in gastrointestinal function, the ultramicroscopic structure and histochemical features of the gastrointestinal tract—these are some of the exciting, relatively unexplored, possibilities for research in gastroenterology, involving many disciplines and interests

A third limiting factor is the lack of adequate communication among gastroenterologists, and between practitioners, gastroenterologists, and other specialists Bettman,[17] in 1907, stated "the surgeons must work hand in hand with the internists, these with the chemists, bacteriologists and experimental physiologists The closest cooperation is desirable" This injunction of more than 50 years ago remains valid today Improved communication per se between gastroenterologists, surgeons, internists, and general practitioners, in joint conferences and cooperative projects, could clarify numerous issues. The need for improved communication includes the gastroenterologic investigator and the gastroenterologic clinician. There have been too many rash comments on the alleged dichotomy between the science and the art of medicine. Competence and interest in research and clinical skills and interests are not mutually exclusive. Thomas Addis was incorrect when he wrote "Medical science and medical art are separate disciplines." Hubbard[18] is correct in stating that "the more scientific the inquiry of the physician about his patient, the better practitioner he is. There need be no conflict between the art and science of medicine, since noble behavior is not diluted by scientific knowledge and good practice depends on both." The scientists can provide new information of diagnostic and therapeutic value to the clinician. The perceptive physician, by careful observation, can assist the investigator in testing new concepts and new therapy, thus serving as a vital link between research and medicine. As expressed by Albright,[10] "Nature has arranged an experiment in a sick individual and partly completed it, all that is needed are the eyes of the clinician to make certain observations and the background of the investigator to plan other observations and interpret them." Since most of the important advances in medicine have emerged from the basic sciences, integration of fundamental research with clinical medicine is necessary to the growth of gastroenterology. Nevertheless, since the ultimate contribution of scientific investigation is toward improvement in the care of the patient, research obviously must include the study of man.

Some Approaches to the Problems of Gastroenterology

Resolution of these problems requires, among other needs, skilled, dedicated teachers, and well-trained, imaginative investigators. The teacher who combines clinical experience, interest in research, and the desire to communicate his knowledge is a precious commodity. In some hospitals and medical schools, gastroenterology continues unrecognized as a specialty, and the teaching, research, and clinical activities in this field remain inadequate. As one result, investigation often is attempted by unprepared or uninformed physicians, who add unscientific material to an already overwhelming literature. Medical centers should reevaluate their programs in gastroenterologic medicine, recognize its significance as an important body of knowledge, and provide appropriate teaching and research opportunities in this field. Granting agencies, private and governmental, must continue to encourage the further development of important research in this field.

More competent physicians could be attracted to this specialty and given the opportunity for superior training. Such a trend actually is in progress, for today, there are more training programs in gastroenterology than ever before—at least 30 supported directly by the National Institute of Arthritis and Metabolic Diseases of the National Institutes of Health, and many other programs. The format and scope of these educational activities vary considerably. At the University of Chicago, training in gastroenterology is offered to selected graduates after 1 year of internship and 3 years of residency training in all phases of internal medicine. The program is at least 2 years in duration, occasionally longer. Clinical activities include the care of patients, instruction in various diagnostic techiques, and participation in conferences both in other areas of medicine as well as gastroenterology, the teaching of medical students, and opportunity for discussions with members of the full-time faculty. Each physician in the program paticipates in clinical or laboratory investigation, or both, depending upon individual interest and ability. The value of a research experience, albeit brief, in the education and development of competent, objective gastroenterologic internists deserves emphasis. With the increase in fundamental knowledge, medicine has become more scientific. The modern physician is required to be better prepared to incorporate scientific advances into clinical practice than his predecessors of only a decade or two past. Anatomic and pathological mechanisms of disease, while obviously important, have been supplemented by biochemical and biophysical concepts. This knowledge cannot be acquired wholly during the conventional medical school and hospital training period. For those interested in academic and research careers, additional education is essential therefore. As one solution, training programs in gastroenterology could be expanded and selected participants encouraged to study basic sciences, such as genetics, immunology, pathology, physiology, biochemistry, biophysics, or biostatistics, to develop an adequate scientific background for useful research. Each institution, of course, must adapt the training program to its own facilities and objectives. My experience leads me to emphasize the advantages of the full-time academic system in this regard. However, many worthwhile programs are possible, and the geographic full-time system also functions well for this purpose. Diversification is preferable, provided high standards are maintained.

The current glamour of "basic research" notwithstanding, there also must be renewed attention to the patient as a person. There is definite danger, with the present emphasis upon research and the apparent de-emphasis of professional skills and teaching ability, that instruction in clinical medicine will deteriorate. We must remind ourselves that no matter how scientific medicine becomes—and I believe in this objective—its ultimate goal is service to humanity As expressed by T C Albutt, "the glory of our profession is that we are concerned not only for mankind, but for man" We should endeavor, therefore, to achieve an appropriate balance between the science and the art of medicine, utilizing not only the laboratory, but also the patient, not only biochemical techniques, but also clinical observation The comprehensive program in gastroenterology easily can, and should, maintain positive interest in the humanistic as well as the scientific aspects of the specialty, for without this dimension, gastroenterology, and indeed all specialties, lose perspective and purpose

Role of Section on Gastroenterology and Proctology

Until now, I have not commented directly upon the Section on Gastroenterology and Proctology of the American Medical Association The scientific prestige of this Section appears to have diminished in recent years, and its clinical and scientific components seem to have separated This division is undesirable and unnecessary Clinicians should become more familiar with the scientific problems of gastroenterology, just as the scientist should be aware of the clinical issues By developing quality programs that incorporate both phases of gastroenterologic medicine, the Section can provide an appropriate mechanism for uniting the investigator and the clinician, and the specialist and general practitioner, in the further development of gastroenterology In this function, the Section on Gastroenterology and Proctology would be fulfilling the traditions established for it by Murray in 1917[20], namely, the interchange of knowledge between specialists in gastroenterology and general practitioners, and the advancement of teaching and research in this field of medicine

Conclusions

These comments reflect my conviction of the importance of broad specialization in modern medicine and of the necessity for wider acceptance of gastroenterology in the United States as an important medical activity, as well as my belief in the indivisible inter-relationship between the science and the art of medicine A renewed and productive interest in disorders of the digestive system has developed, with an increasing awareness of the potentialities of both fundamental and clinical investigation in this field More than ever in its long history, gastroenterology today offers unparalleled opportunities for comprehensive clinical activity and for significant research We need only to recognize these exciting vistas and to grasp the opportunities

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PHYSICIAN TO QUEEN MARY—Though an Englishman, we find Dr Caius reading lectures on Aristotle in the University of Padua, and afterwards using the influence he possessed at court, where he was Physician to Queen Mary, in behalf of literature for it was at this instance that a licence was obtained from the Queen to advance Gonvil-hall at Cambridge, and incorporate it under the name of Gonvil and Caius College—The Gold-Headed Cane, London, J Murray, 1828

The Challenge of Disability to Medicine

Emphasizing the Need for the Timely Recognition of Impaired Function and the Application of Specific Rehabilitative Procedures

Charles D Shields M D , and Bernard D Daitz, Ph D , M S P H Washington, D C

Physical disability affects the health, welfare, and economic status of many individual Americans Organized medicine and official health agencies must develop methods designed to preserve functional capacity and delay the onset of disability Basic medical research, good clinical practice and extensive rehabilitation services should be made available to protect and maintain individual health and efficiency The physician has a responsibility to provide complete medical services which must be correlated with nonmedical community functions When illness or injury prevents an individual from working for 30 days or more he often needs some financial assistance Physical disability thus places burdens on the community The medical profession must become interested in stimulating the improvement and expansion of prepayment insurance plans to prevent disability and to reduce its effects

THE TERM CHALLENGE in recent years has become a euphemism for a problem which is unpleasant or difficult to solve Nonetheless, medicine has met many such problems in the past Paradoxically, these achievements of medicine have created the challenge facing us now—the challenge of disability More people are living longer because of medicine's accomplishments The continuing increase in the size of the total population, the number of persons in the age group 65 years and older, and the increase in life expectancy (Fig 1) place more people at risk to chronic disease and long term illness, with resulting impairment of function, and consequent disability

The U S National Health Survey [1] has estimated that almost 70 million persons, approximately 41% of the civilian noninstitutional population, are affected by one or more chronic conditions While this number probably includes individuals with minor and relatively nondisabling conditions such as bronchitis, hay fever, and other allergic manifestations, the total does include a substantial number of persons affected by the more serious and disabling diseases (Fig 2) Over 17 million persons, almost 10% of the population, have some limitation in their ability to engage in activity as a consequence of one or more chronic conditions (Table 1) Almost 5 million persons are estimated to have limited mobility A significant disproportion of impairment and disability is evident in the age groups 45 64 years and 65 and older

The magnitude of the problem of disability can be illustrated as it relates to available manpower and to the cost of care services The data presented in Table 2 are based on the assumption that there are 10 million persons with manifest or incipient functional impairment associated with chronic disease (or injury), and that these individuals require medical care to prevent further impairment or to help them achieve a higher level of functional capacity Such an assumption appears to be both valid and conservative on the basis of the estimates developed by the U S National Health Survey

Let us further assume that each disabled individual requires an average of 40 hours of professional care per year that includes 5 hours per year of physician services, 10 hours per year of nursing services, of physical therapist services and of occupational therapist services, and 5 hours per year of social services, speech therapy, or other necessary therapist services If we assess these services at $10 per hour, the cost is $400 per year per patient, and the total cost is 4 billion dollars per year for the 10 million persons This figure does not include institutional costs, nor does it include the cost of medication or other medical or prosthetic supplies and equipment

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Read before the Section on Physical Medicine at the 109th Annual Meeting of the American Medical Association Miami Beach June 15 1960

In 1958, benefits paid to disabled beneficiaries of the Federal Old Age and Survivors Program amounted to 249 million dollars, the combined Federal and State public assistance expenditures for aid to permanently and totally disabled beneficiaries amounted to 238 million dollars for the period 1957-58, and aid to crippled children amounted to more than 53 million dollars [2] These data obviously represent a partial accounting of the total cost of disability, for they do not include costs borne by the Veterans Administration, the Federal-State vocational rehabilitation programs, private insurance companies, or the disabled individual and his family

Assuming the existing need for care services and the current availability of professional services are as shown in Table 2, the implications relative to manpower are likewise impressive We appear to require for a group comprising 5 5% of the total population approximately 12% of the total available time of physicians and nurses, some 43,000 additional physical therapists, 44,000 additional occupational therapists, and 20,000 additional social workers, speech therapists, and others Among the 225,000 physicians there are only about 300 physicians who are qualified in the specialty of Physical Medicine and Rehabilitation There are approximately 7,000 physical therapists, 6,000 occupational therapists, and a comparative handful of facilities providing rehabilitation services for severely impaired patients

These estimates provide some indices of the problem of disability whose dimensions encompass social, economic, and political, as well as physical and emotional health features Some of the symptoms are evident in the current ferment about developing health services for the chronically ill and the aged, and in the discussions concerning development and rapid growth of prepayment health benefit programs to finance these services

It is clear that the problem of disability is a substantial one, that it is growing, and that the measures which have been employed thus far are producing a relatively insignificant impact We are compelled, therefore, to examine more closely the various components which are involved in the problem of disability

The preponderant focus of rehabilitation services is upon patients with manifest, severe functional impairment and consequent disability This is characteristic of rehabilitation services whether provided in rehabilitation centers or in hospitals The prevailing concept of rehabilitation thus presumes the existence of disability as a prerequisite to initiating rehabilitation services In other words, rehabilitation at present is considered a measure of last resort for patients with obvious impairment or disability Until there is evident impairment, patients do not seem to get either the medical evaluation or the care which has been found useful in rehabilitation facilities

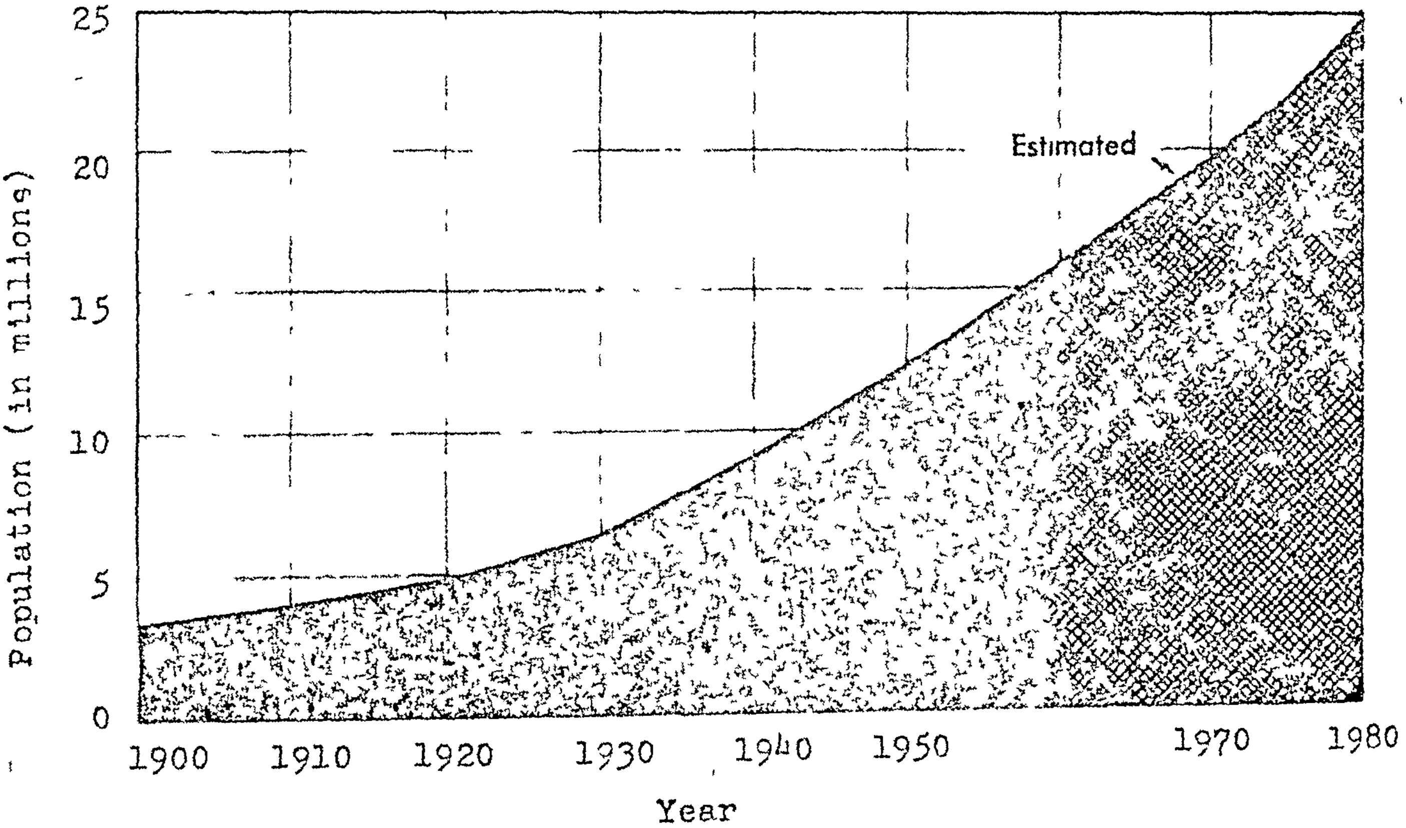

Fig 1—Population of United States 65 years of age and over (source Bureau of Census Population Reports)

Patients who usually come to rehabilitation centers or to rehabilitation departments in hospitals have residuals which are, in part, the direct consequences of disease, injury, or congenital defects. These may be loss or absence of a body part or functional loss in a part of the body. The usual objective of treatment, therefore, involves either restoration or substitution of function. All too commonly, however, such patients also present other residuals among which are atrophy, contracture, periarticular fibrosis, bed sores, incontinence, and nutritional, emotional, social, and economic deficits. Actually, these residuals comprise a complex of impairment which is considerably more difficult, time-consuming, and costly to deal with than those which result directly from disease or injury. More important, these concomitant residuals are to a substantial degree preventable.

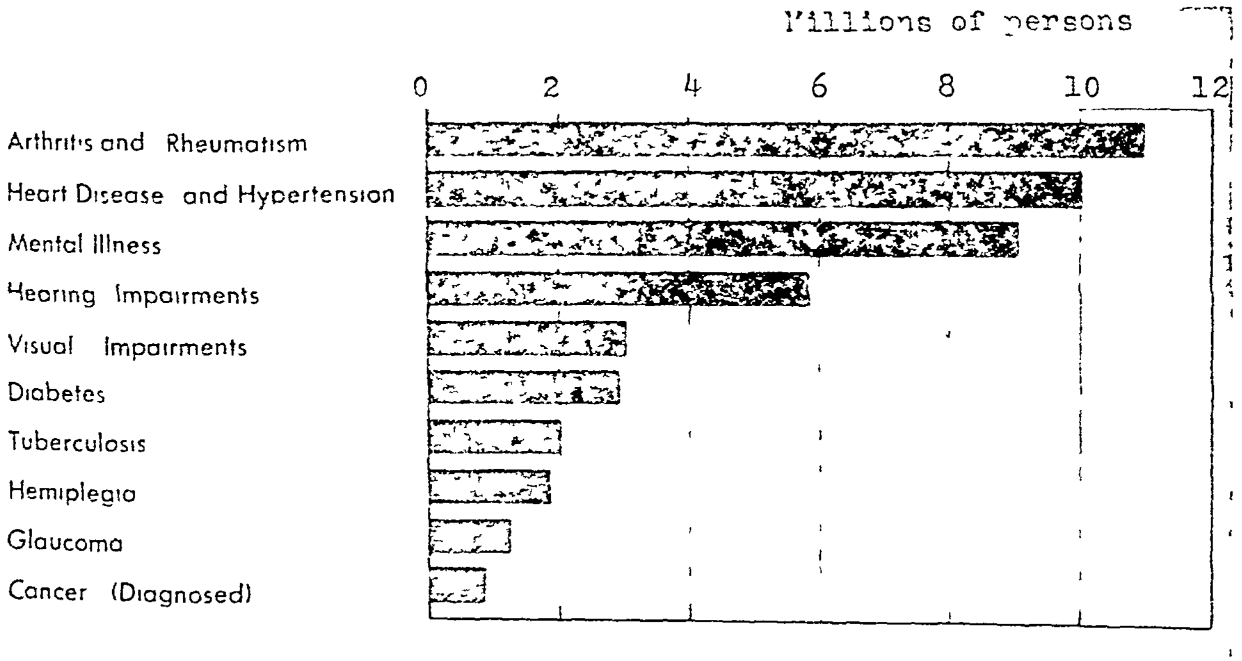

Fig 2.—Estimated prevalence of specified chronic diseases and physical impairments (source: Chronic Disease Program, Public Health Service, Department of Health, Education and Welfare).

Hippocrates is said to have observed that, if a muscle is not used, it atrophies. Others more recently have related this principle to the dangers of immobilization. In 1948, Deitrick, Whedon, and Shorr[3] demonstrated that immobilization of normal, healthy individuals produces a syndrome with components strikingly reminiscent of those which all too commonly are characteristic of disabled people. Within six weeks the normal, healthy young men who comprised these authors' study group and who were immobilized in bed by plaster casts covering the pelvic girdle and legs, developed a negative nitrogen balance and lost the equivalent of 4 lb (1.8 kg) of muscle tissue. There was obvious decrease in the girth of extremities, development of negative calcium and phosphorus balance, disruption of creatine metabolism, stiffness and soreness of the joints persisting for three to four months after mobilization, deterioration of stance reflexes, decrease in blood volume and circulatory system integrity, general weakness, and some psychological reaction.

This study and others[4,5] incriminate immobilization as a major influence in producing the familiar complex of functional impairment which is the common feature in disability: atrophy, contracture, periarticular fibrosis, decreased cardiocirculatory efficiency, nutritional deficit, and the usual accompanying emotional, social, and economic complications.

Until means are found to prevent or cure the diseases which result in long-term illness, prevention of the residuals comprising the 'immobilization syndrome' obviously is a most important potential for meeting the challenge of disability. Functional management of patients with potential or incipient impairment is, therefore, a rational concept for the prevention of the residuals of inactivity, with convincing research and clinical evidence of its effectiveness. Equally significant is the fact that, if this form of patient care is initiated early and before the development of physical, emotional, social, or economic impairment, it will not require the same intensity of care or the diverse and highly specialized professional skills which are necessary when dealing with patients with severe disability. There is ample evidence that such management is effective in helping to preserve physical, social, and economic capacity in patients with long-term illness There is need, consequently, for much wider application of the techniques of this form of patient care in medical practice

The practicing physician obviously is the key to effective implementation of such preventive measures The Committee on Rehabilitation of the American Medical Association has urged that "every individual physician can and should assume responsibility for the rehabilitation of his patients "[6]

TABLE 1 —Limitation of Activity (Estimated Number of Affected Persons, July September 1957, U S National Health Survey)

	Ages, Yr			
Degree of Limitation	**Total All Ages**	***Under 45***	**45-64**	***65 and Older***
Not limited in major activity, but otherwise limited	4,624,000	1 797 000	1,634,000	1 193 000
Limited in amount or kind of major activity	8 822 000	2,618 000	3 200,000	3 004 000
Unable to carry on major activity	3 588 000	547 000	977,000	2 063,000
Total	17 034 000	4 962 000	5 811 000	6,260,000
% of total by age group	100	29	34	37

Within the scope of this recommendation every physician also has the responsibility for preventing or limiting the disabling residuals associated with long-term illness

Modern surgical management, for example, now involves preoperative planning which anticipates problems that may result in functional impairment, as well as postsurgical care involving early ambulation and measures to preserve or restore functional capacity The same principles of functional management can be equally effective when employed in treating patients after a stroke, patients with arthritis, or persons with other neuromuscular or musculoskeletal disturbances

Functional management to prevent or limit the residuals produced by inactivity should be initiated as soon as possible This requires assessment by the physician of the residual-producing potential of inactivity as he develops and plans the treatment regimens of his patients with long-term illnesses It entails continuing evaluation of such factors as muscle strength, joint function, fascial tightness, alignment of body segments, cardiocirculatory function, nutritional status, and emotional, social, and economic integrity For some of these procedures, the doctor may desire consultation and assistance The patient with neuromuscular or musculoskeletal impairment usually will require special measures to help preserve and, when possible, restore function If inflammation and pain are present and *limit movement* or activity, appropriate medication will be useful to help overcome reluctance to voluntary movement of the affected parts

There is no question that severely impaired or disabled patients require organized special skills, procedures, and equipment This does not, however, preclude the physician who is not trained in the specialty of physical medicine and rehabilitation from learning and applying many of the principles and procedures which are practical and effective in preventing or limiting disability It cannot be denied that the overwhelming majority of patients with long term-illness are treated by general physicians and internists

Unlike the more conventional treatment measures, such as the use of drugs and nursing care, functional management generally requires that the physician involve and direct other trained professional persons, such as physical therapists, occupational therapists, speech therapists, prosthetists, and medical social workers Ordinarily, the services of such personnel are available to the physician only *when they exist in a hospital setting* In rare instances they are found as community resources which the doctor can call upon to serve those of his patients who are being treated at home or in his office If these services are available, they usually comprise the elements of an organized home care program Some 40 to 50 such organized home care programs with a total patient load of approximately 5,000 have been identified Much needs to be done to stimulate the development and implementation of organized home care programs as a means for *providing comprehensive care services for patients* in their own homes

Reference already has been made to the shortage of trained personnel such as nurses, physical therapists, occupational therapists, medical social workers, and others The need to develop more effective utilization of the various ancillary skills has been identified by the Committee on Rehabilitation of the American Medical Association In its report[6] the Committee urges that physicians accept leadership to assure that "adequate and total rehabilitation services are available to (their) patients *The* physician should take the lead and direct the rehabilitation team if the important, traditional physician-patient *relationship* is to be maintained and his patients are to receive all of the benefits total rehabilitation *has to offer* "

TABLE 2 —Estimate of Care Services and Care Potential Based on Minimal Professional Time Required by 10 Million Disabled Persons

Type of Professional Service	**Estimated Average No of Hr Required Per Yr Per Person***	**No of Hr Required for 10,000,000 Persons Per Yr**	***Estimated No in Profession†***	***Estimated Annual Total Hr Potential‡***
Physician	5	50,000,000	225,000	450,000 000
Nurse	10	100,000,000	430,000	860 000,000
Physical therapist	10	100 000 000	7,000	14,000 000
Occupational therapist	10	100,000,000	6,000	12,000,000
Medical social worker	5	50,000 000	5,000	10,000,000

* Source *Health Manpower Chart Book* Public Health Service Publication 511, U S Department of Health Education and Welfare *Includes professional personnel whose services may not be available in private practice or whose specialty is not applicable*

† Based on work year of 2,000 hours

Responsibility for patient care rests primarily with the physician, and he must have proper respect for this obligation when he elects to delegate some of this responsibility Delegation of specific tasks to others in caring for the sick and injured to prevent disability and rehabilitate those who have become disabled is a new problem for medicine Such delegation requires medical direction and supervision and continuous study to identify functions that properly may be entrusted to others, as well as the amount and type of training that is required to assure a reasonable basis for adequate and responsible performance It may be that more effective utilization of trained personnel will necessitate modification of existing concepts which involve nurses and therapists in providing direct care services to patients Many rehabilitation units already have found it necessary and effective to involve trained personnel to teach the relatives and, in some instances, the friends of patients to assure that the treatment of the patient will continue at home after discharge from the facility With proper supervision by competent personnel, this procedure can provide the much-needed helpers to assist in the care of patients

There is also an obvious and urgent need to help practicing physicians keep abreast of current developments in this area of medical practice Undergraduate and postgraduate emphasis on the principles and practice of physical medicine and rehabilitation is, of course, a major means for introducing these principles and elements of practice into the mainstream of medicine Effective utilization of restorative medical services must be better developed through teaching and research in medical education and practice A number of medical schools already have established departments of physical medicine and rehabilitation and have developed curricula for the undergraduate medical student and for the training of residents At the Georgetown University School of medicine, teaching of the principles and practice of physical medicine and rehabilitation is accomplished by incorporating instruction in purpose, methods, and techniques into existing curricula[7]

The problem of reaching practicing physicians with information relative to this aspect of medical practice is truly formidable Stimulation of interest is the first step The Committee on Rehabilitation of the American Medical Association has made an important, and much-needed, beginning in this area Counterpart committees already have been created by a number of state and county medical societies, and these may serve as the focal point for efforts at the local level to stimulate and promote the interest and active participation of physicians in medical rehabilitation activities There is need, however, to devise and implement additional methods for reaching physicians with information on all current developments in medicine including rehabilitation methods Lectures, seminars, and clinic sessions for physicians, such as those sponsored by the American Academy of General Practice, the American Academy of Physical Medicine and Rehabilitation, and the American College of Physicians might well deal with the concept and methodology of rehabilitation and prevention of disability Publications such as "Strike Back at Stroke"[8] and "Strike Back at Arthritis,"[9] developed by the U S Public Health Service, appear to be tools which practicing physicians will find useful in managing patients with long-term illness

It is obvious that the shortage of trained personnel and the lack of appropriate community resources, such as organized home care programs, impose serious limitations on the physician's ability to provide comprehensive medical care for his patients with long-term illness An equally important limitation is the high cost of the complex of services required It is estimated that only about 20% of the total cost of medical care is for the services provided by physicians, comprehensive medical care usually includes, in varying degrees, services of nurses, therapists, and counsellors as well as hospitalization, drugs, medical supplies, and equipment Therefore, expenditures for comprehensive care must be allocated among the various medical services Most of the present health insurance plans offer coverage for hospitalization and a few other services They are, however, inadequate to cover the costs incurred in the course of long periods of illness They offer a false sense of security to people who are unaware of the economics of catastrophic illness Although there has been a marked change in recent years in the way medical care is financed in the United States, the individual wishes to accept responsibility to provide for himself and his family Therefore, there is need for the medical profession to provide the necessary leadership to help develop acceptable means for paying for adequate and complete care services to protect the average family from becoming indigent in attempting to meet the costs of long-term illness

It is apparent that disability is a problem which involves social and economic decrement as well as physical and emotional impairment Because functional impairment commonly is a predisposing factor to disability, there must be a broader view of the objectives of medical practice to prevent and limit disability in addition to the more generally accepted responsibility for dealing with the symptoms of disease Success of the attack on disability will depend in large measure on the efforts of every physician to apply existing knowledge and to stimulate the development of complementary health services within the community

Summary

The National Health Survey of 1957-1958 shows that disabilities of many types affect Americans of all ages The number of persons whose health becomes impaired by disease or injury is increasing Medical rehabilitation services and methods to prevent disability must be better understood, better developed, and more effectively used in dealing with conditions that limit activity and mobility There must be general acceptance and utilization of measures that are available to prevent disability or to delay its onset We must seek improved methods to accomplish this purpose Functional management to prevent disability begins when the physician first sees a patient with disease or injury that may result in functional impairment and continues as long as the patient needs medical and other supportive services to sustain his maximum function

The complexity and high cost of complete services that are so essential in dealing with long-term illness must be recognized The medical profession, through local medical societies and other organized groups within the community, must overcome inertia and lack of understanding in order to develop full community support to cope with the problems which constitute the challenge of disability to medicine and to the nation

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CARE IN THE USE OF IONIZING RADIATIONS—The production of fetal anomalies by the direct action of ionizing radiation upon differentiating embryonic cells has been amply demonstrated Similarly the genetic consequences of irradiation which are probably accumulative without relation to a minimum threshold are well documented The production of growth arrests in growing children as well as the immediate and delayed production following medical x-radiation and particulate radiation of tumors, particularly carcinoma of the thyroid, sarcomas of bone and leukemias, has been confirmed repeatedly We must base our future policies upon the tolerance of the most susceptible in our population, upon a full understanding of the cumulative effects of radiation and upon the generally accepted hypothesis that a linear relation exists between dosage and radiation injury From a practical standpoint, we must exercise extreme caution in utilizing ionizing radiation in any pregnant woman In infants and children there should be a general rule to use it most conservatively in treatment and even in diagnosis dealing with nonfatal conditions When indicated, x-irradiation for either therapeutic or diagnostic purposes should be used without hesitation but with careful attention to technical details and particularly on proper shielding of the patient's body outside the target area Finally, levels of irradiation to be expected from the judicious use of properly designed and operated x-ray equipment and isotopic preparations are well within estimated permissible doses at the present time, and many of the tragic errors of the past are being or will be corrected in the light of present knowledge It is appropriate, in bringing this discussion to a close, to pay respect to the progressive and self-critical attitudes and practices of our radiologist colleagues It would be well for all physicians to seek their advice and follow their precepts —C G Grulee Jr, M D, Pre- and Postnatal Irradiation Hazards for Infants and Children, *Rocky Mountain Medical Journal*, April, 1960

SPECIAL CONTRIBUTION

Status of Human Plasma as a Plasma Volume Expander

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Review of Plasma Studies

Although transfusions of plasma were suggested, they were not tried as substitutes for blood transfusions during World War I Numerous studies of plasma were made during the period between World War I and World War II, but most of them are not particularly relevant to this report Wartime enthusiasm for the use of plasma began in 1939 when Tatum and associates[1] recommended it as an ideal substitute for whole blood in emergency treatment of shock and hemorrhage from war wounds' During subsequent months, others echoed these recommendations In 1945, DeBakey and Carter[2] commented that the misconception concerning plasma as a blood substitute' became so widespread and so firmly entrenched in the minds of both administrative and professional personnel that it impeded the organization and the development of more effective measures for the management of shock

The first lesson to be learned, then, was that, although plasma was useful for bringing the wounded man out of shock and for maintaining his blood pressure temporarily during initial evacuation and until a blood transfusion could be prepared, it was by no means a complete or physiological substitute for whole blood in the treatment of the severely injured man

Misconceptions and Errors—Fallacies that attended the use of plasma early in World War II are now widely recognized and should not be forgotten Nor should they be permitted to obscure its value and importance in supporting life during the transportation of a casualty to an installation center where transfusion of whole blood and other resuscitative measures, including surgery, can be performed As the stopgap nature of plasma administration was recognized and acknowledged, this substance began to occupy its proper place in the management of the injured, and the demand for this material increased as World War II progressed

Large quantities of plasma used in a wide variety of combat situations imposed certain demands for practicality in its production and packaging In order to improve the efficiency of production, the process of pooling the plasma of from 50 to 200 donors was developed This process also eliminated the necessity for administering type-specific plasma at the battlefront, because the agglutinins of a given donor s plasma were so diluted as to be of little or no importance to the recipient Plasma in the dried state was found to be less vulnerable to a wide variety of shipping and storage conditions, and the product which was ultimately developed and widely used was dried pooled plasma

Although the processes of pooling and drying increased the practicality of plasma, they also were destined to constitute the basis of its discreditation If one should happen to ask a virologist how he would maintain alive a virus that would be used for studies sometime in the undefined future, he would likely reply that he would freeze it or freeze and dry it Homologous serum jaundice or serum hepatitis is presumed to be caused by a virus The processing of plasma during World War II included drying from the frozen state, which probably aided the presumed virus of homologous serum jaundice or serum hepatitis to survive and maintain its capacity to transmit disease

Pooling increased the probability that the recipient of the pooled plasma would receive his plasma from a carrier of serum hepatitis and would thereby contract the disease This probability increased, of course, in direct proportion to the number of donors comprising the pool The problem of homologous serum jaundice was recognized even before World War II, but it does not appear to have become a problem of major concern until near the end of the war and during the period between World War II

Chief Surgical Research Branch Army Medical Research and Development Command

Read (in part) before the Medical Education for National Defense Symposium on Blood Fluids and Trauma Dec 17 1959 Walter Reed Army Institute of Research Walter Reed Army Medical Center Washington D C have tried this method, and the method has been adopted and is being used by numerous outstanding civilian medical institutions The chief complaint of those who have used the method appears to be the fact that the demand for the shelf-stored plasma exceeds the supply

Although most have conceded that Allen's work offers practically incontestable evidence that pooled plasma stored in the liquid state for six months at 31 to 32° C is incapable of transmitting serum hepatitis, some still point out the disadvantages of this method In the first place, at least six months are required to prepare a lot of plasma, then, a considerable amount of storage space is required, also, there is considerable risk of bacterial contamination *during storage, finally, none of the valuable* plasmas fractions as fibrinogen and gamma globulin is salvaged for other use

Time is required to prepare any product Considering the time that is required for the preparation of albumin, for example, it is probable that its preparation requires somewhat less than six months, but this is considerably longer than one would imagine The risk of bacterial contamination is an objection which seems to be raised by those who either have not tried the method or those who may have subjected stored plasma to repeated sampling to determine whether it was contaminated, Hoxworth informally stated that his incidence of contamination is less than 1 per cent and that he has been able to detect every bottle of contaminated plasma in his storage room merely by visual inspection Admittedly, storage space during the aging process is required, but storage space can be found for aging any worthwhile product, including whiskey The loss of the plasma fractions can be tolerated at present

Stockpiling

The Department of Defense's stockpile alone contains roughly 2,900,000 Gm (over 3 tons) of dried gamma globulin and a smaller amount of gamma globulin in the liquid state To date, nobody seems quite certain what we are going to do with all of this Fibrinogen can be easily obtained in the amounts required for present use

Before we arrive at a point worthy of current cogency, we must consider the Department of Defense and Office of Civil and Defense Mobilization's stockpiles of pooled ultraviolet irradiated dried plasma, all of which is now outdated, and what is being done with them The Department of Defense's stockpile contains about 125,000 units, and the Office of Civil and Defense Mobilization's stockpile consists of about 1,300,000 units of this material Some have referred facetiously to it as "our national stockpile of hepatitis virus" The problem of what to do with this material was under consideration for a number of years Estimates of the cost of reprocessing this plasma ranged between $8 00 to $12 00 a unit which involved a considerable amount of money After discussion of all of the various modified processes which might be used, the decision was finally made that none of these was yet ready or suitable for this purpose The recommendation was made that the outdated plasma be processed to serum albumin, and this processing, up to the time of this writing, is underway One of the chief reasons for this recommendation concerned the lack of knowledge of storage characteristics or shelf life of the newer modified plasma products The shelf life of albumin is known to be at least five, and is probably eight, years and may be even longer if the material is kept refrigerated Albumin has long been recognized as a good, safe, and effective plasma expander Logistically, it has many advantages Its main disadvantage it its cost concerning the amount of blood, technical skill, apparatus and personnel required to produce it—consequently, the monetary involvement Although plasma expanders are not given primarily for their antibody content, other objections to albumin include the loss of antibodies which are naturally present in the globulin fractions of plasma and the supposition that albumin draws water from the tissues into the intravascular space, therefore, its use is dangerous to the patient with dehydration The globulins and other fractions may be salvaged during the fractionation process and administered separately for specific indications

Present Status of Plasma and Plasma Products

This sketchy summary of the past history of plasma and plasma products brings us to the present A threatening crisis as the Lebanon affair or the Berlin ultimatum serves to remind us that, although men may be put into space within a year or so, there are also plenty of everyday mundane problems to which we do not have completely satisfactory answers At present, we have three possibilities for meeting an emergency situation with natural plasma expanders for treatment of the resulting casualties from conflicts The *first* and most readily available is serum albumin, the stockpile of which is being increased by the processing of outdated plasma

The *second* is the plasma product which is manufactured and sold commercially The production of this plasma fraction no doubt could be greatly increased if the need arose, but it is not being stockpiled at present, primarily because of the lack of data regarding its storage shelf life Its characteristics *and properties* are known to have remained practically unchanged for at least two years Stockpiling a less expensive plasma product which will not last at least five years for certain may be pennywise and pound-foolish if one has an alternate substance with a known shelf life of that duration, even though the original cost of the alternate may be greater If proof is obtained that this product has a shelf life of at least five years, then this substance may become a likely candidate for stockpiling (Since this writing, word has been received that NIH has approved a shelf life of five years for the commercial plasma product)

The *third* possibility is the whole pooled plasma stored in the liquid state according to the concepts of Dr Allen This material is being prepared and used locally in numerous civilian institutions, and one or two laboratories are producing small quantities for commercial distribution The initiation of a program to produce plasma by this method in quantities sufficient to meet the demands of a national emergency or to build a national stockpile would take at least six months and probably a year The electrophoretic patterns show that only minimal changes occur in liquid plasma collected in sodium citrate solution and stored at room temperature (Fig 2) Deterioration of the electrophoretic pattern of the liquid plasma collected in glucose solution is somewhat more rapid There are good reasons for believing that deterioration and changes in these plasma proteins can be reduced by drying the plasma after it has been rendered incapable of transmitting serum hepatitis by storage under the conditions already described Efforts are being made to check this evidence The only natural plasma expander acceptable for stockpiling at present, then, is albumin

Meanwhile available methods for collecting and using plasma are not being utilized in Army medical service installations These installations within the continental United States obtain about 50,000 units of blood a year The simple procedure of collecting a "tax of 75 ml of plasma from each of these units of blood by the satellite bag method described by Crosby and associates [18] would yield 7,500 five-hundred-milliliter units of plasma a year Drawing 150 ml of plasma from each unit would double the yield During the first part of 1960, we hope to conduct some clinical evaluation and familiarization tests of both shelf-stored plasma and the commercial product under military-medical conditions

Several months ago, a National Research Council committee recommended that, whenever possible, suspended red blood cells rather than whole blood be used for transfusion unless definite indications existed for the use of whole blood After all, in most blood transfusions, the primary interest is in the erythrocytes and the hemoglobin they contain rather than in the liquid components of the blood This recommendation would permit the Army Medical Service, to say nothing of the other users of whole blood, to collect with relative ease 25,000 units of plasma annually in its medical installations within the United States The Army Medical Service has not yet followed the National Research Council recommendation because, at present, we have no program or mechanism for handling and processing this amount of plasma Nevertheless, the potential exists The point should also be made that the 25,000 units of plasma per annum could be collected as part of our routine peacetime program for the procurement and utilization of blood If special efforts were to be made to increase the collection of plasma, the collection could be increased to considerably more than 25,000 units annually

Comment

A discussion of the present status of the plasma program is, therefore, relatively simple, and almost before one realizes it he has made the transition to the future and is talking about what could be, will be, and might be done Having already dispensed with the more obvious possibilities for the immediate future, we may now proceed to those possibilities in the field of plasma expanders which are less obvious, perhaps more remote, but nonetheless interesting

We would like very much to have an entirely satisfactory plasma expander which is cheap and effective, and which does not depend on the human being as its source Although usable artificial plasma expanders exist, none is completely satisfactory, and many clinicians are reluctant to use them Some of the synthetic polypeptides show promise of becoming good plasma substitutes If development of the synthetic polypeptides is successful, and by that I mean that these substances must be cheap and completely effective and satisfactory as plasma expanders, the present concern over the use of human plasma as an expander may vanish

Another possibility which may eliminate further consideration of human plasma as a circulatory volume expander is that of animal plasma or serum albumin Numerous attempts have been made to treat albumin and other plasma proteins from animals, chiefly of the bovine species, so that they could be used as plasma expanders in humans So-called "despeciated" animal albumins have been and are being used widely as human plasma expanders in several foreign countries When one studies these materials carefully, one is astonished at what the human organism will tolerate—at least once The main problem with despeciated animal albumins is still their antigenicity We have tested at least one of these products in the laboratory and found that as a plasma expander it is probably not as effective as isotonic sodium chloride solution and is probably considerably more dangerous Apparently the process of despeciation also includes considerable denaturation of the protein, at least the protein is denatured as far as the human is concerned Our tests have shown that a considerable percentage of the foreign animal protein is

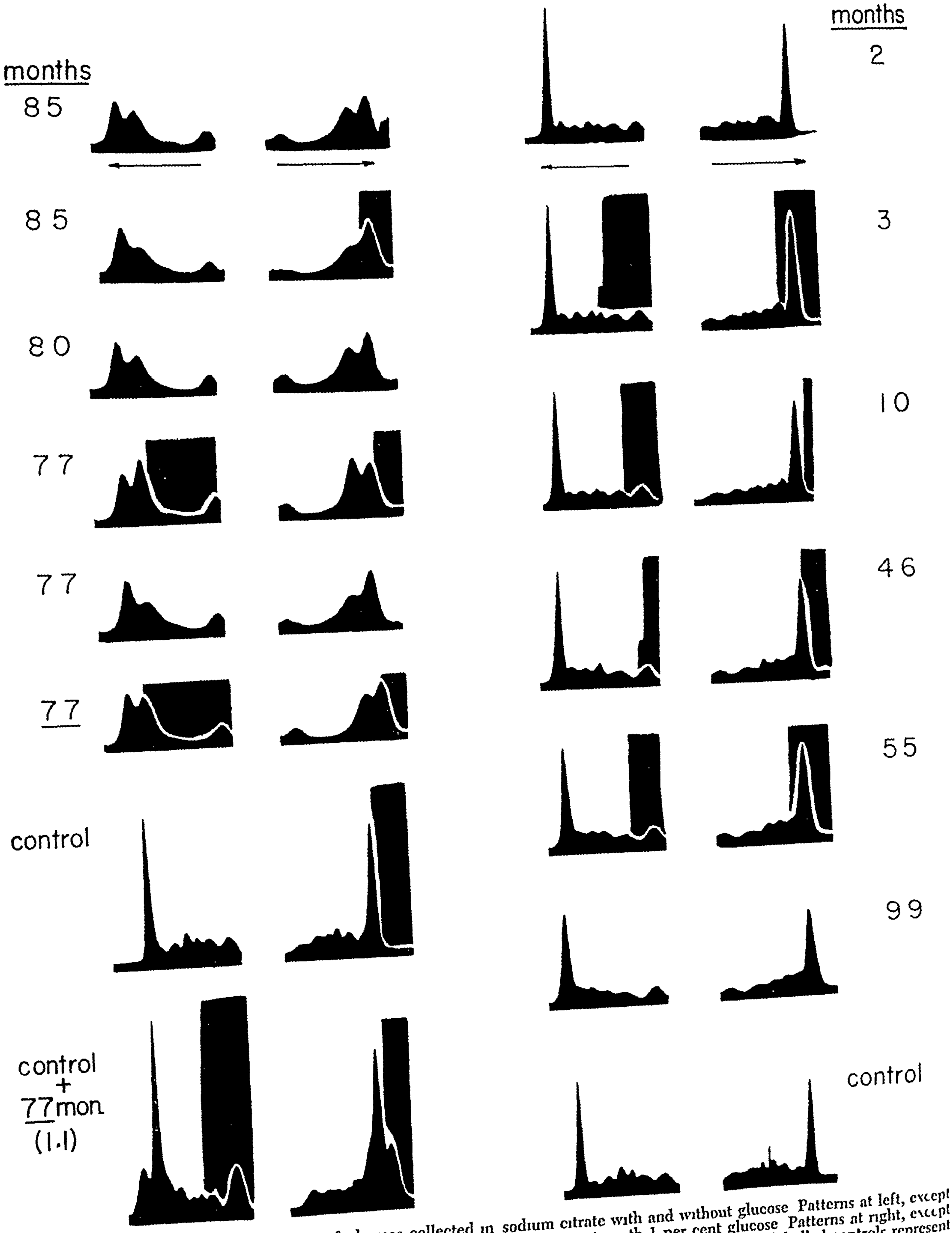

Fig 2 —Electrophoretic comparisons of plasmas collected in sodium citrate with and without glucose Patterns at left, except those labelled controls, were made with plasma collected in sodium citrate with 1 per cent glucose Patterns at right, except that labelled control, were made from plasma collected in sodium citrate without glucose Patterns labelled controls represent plasma collected in Sequestrene The months indicate months of storage in liquid state (After Hoch, H, and Chanutin, A Electrophoretic Study of Human Plasma Stored at Room Temperature, J Biol Chem **209**:661-669 [Aug] 1954, by permission of Dr Chanutin and the Editor, J Biol Chem)

rapidly removed from the intravascular fluid, probably by the reticuloendothelial system If there is any truth to the endotoxin theory of irreversible shock and the suggested role of the reticuloendothelial system in disposing of endotoxin, blocking of this function by the administration of denatured protein (and this includes denatured protein in human is well as animal plasma) is probably not a very helpful thing to do to a patient in shock Conceivably, this procedure might turn ordinary shock into irreversible shock Although at present we know of no despeciated animal protein which meets our criteria for a suitable plasma expander, we still consider this an interesting possibility and have by no means closed the door on the subject

When everything possible has been done and said in regard to the artificial and other proposed plasma volume expanders, we probably shall return to the conclusion that there is no real substitute for human plasma except human plasma itself We shall develop artificial plasma expanders which are quite satisfactory and useful, but none is likely to have all of the desirable qualities of natural human plasma with all of its various components Therefore our interest in plasma probably will continue for some time

Although we have developed more or less empirical methods for ridding pooled plasma of its capability to transmit serum hepatitis, the main factor which has retarded progress in the development of a hepatitis-free plasma is the combination of our inability to identify the hepatitis agent, our lack of methods for studying this agent in the laboratory, and the consequent necessity for taking the risk of testing new products in humans We shall not be on really firm ground with this problem until we have identified the causative organism of this disease and have found a biological specimen other than man in which we can study this disease in the laboratory Througnout this discussion, great care was taken in not stating that shelf storage of plasma in the liquid state at elevated room temperature, heating partially fractionated plasma, or any other method killed or destroyed the etiological agent of homologous serum jaundice To have done so would have been presumptuous and possibly untrue, for we have not identified the etiological agent of this disease Although it meets most of the criteria and has been characterized as a virus, the evidence that it *is* a virus is all circumstantial At present, we are on shaky ground, and the most that we can say correctly is that there is evidence beyond reasonable doubt that we have means for rendering plasma products incapable of transmitting homologous serum jaundice or serum hepatitis Our insecurity in this matter will continue until we identify the etiological agent of this disease, and our difficulty in evaluating the safety of plasma products will continue until we have found an experimental model other than the human volunteer in which we may study the factor of hepatitis-transmitting potential, presumably of viral origin

Even though we plan never to use another gram of human plasma or human plasma products, including fibrinogen, thromboplastin, thrombin, antihemophilic globulin, and similar substances of considerable therapeutic value, we still need to know the etiological agent of homologous serum jaundice or serum hepatitis and to develop a method for detecting it if we expect to continue the practice and to mitigate the hazards of blood transfusion The incidence of homologous serum jaundice attributed to blood transfusion varies considerably, depending on the source of blood donors, the average incidence ranging between 0 05 and 2 5 per cent Blood is hardly amenable to the kinds of processing which at present are used to render plasma incapable of transmitting homologous serum jaundice We need either a simple method to detect the carrier of homologous serum jaundice and thus exclude him from our blood donor stations, or we need some method for rendering whole blood incapable of transmitting this disease We can continue our hopes for serendipity and our empirical fumblings among the finite number of possibilities of the former and among the almost infinite possibilities of the latter, but until the fundamental requirements of Koch s postulates have been fulfilled in regard to this disease, we shall not be on very firm ground with either effort

Summary

The past, present, and possible future use of plasma have been reviewed with the object of using some past experience as a basis for present and future planning Aside from the original misconception that plasma was a substitute for blood, the chief problem with pooled human plasma has been the high incidence of homologous serum jaundice associated with its use as a plasma expander Although the etiological agent of homologous serum jaundice remains unknown and unidentified, at least two partly acceptable empirical methods have emerged for ridding pooled human plasma of its ability to transmit homologous serum jaundice These methods are not applicable to treatment of blood, the transfusion of which is also associated with an appreciable incidence of homologous serum jaundice Combining the methods developed for processing safe plasma with the use of developments in transfusion equipment has a potential for making an appreciable quantity of safe plasma available for use in military as well as civilian medical installations Once underway, a program of this kind probably could be expanded to meet most of the demands of future armed conflict, or other national emergency, or could be used to build a stockpile of safe plasma for future use No program

of this kind exists, and because of inadequate data regarding the shelf life and storage characteristics of the newly developed safe plasma products, serum albumin is the only natural plasma expander acceptable for stockpiling Although suitable plasma volume expanders which do not depend on the human source may be developed, the prediction is made that interest in the therapeutic use of human plasma and its components will continue for some time The need for identifying the etiological agent of serum hepatitis and the reasons therefore are indicated

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Dr J Garrott Allen, Chairman and Professor of Surgery, Stanford University School of Medicine, Dr Alfred Chanutin, Professor of Biochemistry, University of Virginia School of Medicine, and Dr Fred F Johnson, Associate Director of Research, Cutter Laboratories, gave helpful suggestions and criticisms regarding this study and permission to use and refer to certain of their data and illustrations

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CHARCOT–SALPÊTRIERE —Guillain's biography contains more than its title implies, for he deals with two celebrated French monuments one a man, J-M Charcot, the other, a medical institution, the Salpêtrière These two, Charcot and the Salpêtrière, are inseparable, for without one there would not be the other in the sense that we understand both of them today So, the author of a true life of Charcot must include a story of the Salpêtrière, if the real depth of Charcot's achievements are to be perceived This Guillain does in a clear, succinct manner He describes how the Salpêtrière began in the seventeenth century as an asylum for the detention of beggers and old women, of prostitutes and perverted girls, and for the incarceration of insane women, how it also served as a prison for women convicted of adultery, theft, or murder and for political prisoners Guillain continues by showing how during the nineteenth century, under the indomitable direction of Charcot, this "pandemonium of infirmities" was transformed into the world's greatest center for clinical neurologic research, which to this day still reflects the genius and inspiration of its founder —G Guillain J-M Charcot, 1825-1893 His Life—His Work, edited and translated by P Bailey, New York, Paul B Hoeber, Inc, 1959

CLINICAL SCIENCE

A New Clinical Syndrome Producing Hypertension—Arteriovenous Fistula of The Kidney

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It is the purpose of this paper to call attention to a renal-vascular syndrome which should be added to the group of known and reversible causes of arterial hypertension, cardiac enlargement, and heart failure

This clinical entity is arteriovenous fistula of the kidney Although this subject was recently documented in an inclusive monographic type of report,[1] the fact that it constitutes a clear-cut clinical entity which is virtually diagnostic was neither mentioned nor emphasized It is hoped that this brief summary will correct this deficiency

The discussion which constitutes the remainder of this paper is the result of a careful analysis of all the cases which have been reported in the literature to date Twelve separate reports of this condition were found in the literature, to which we have added our own three carefully studied cases [1]

Clinical Features

Four basic elements constitute the symptom-complex which outlines the distinctive clinical picture of arteriovenous fistula of the kidney They are as follows

Bruit.—The bruit audible in the presence of arteriovenous fistula of the kidney has the same continuous character, with systolic accentuation, as is typical of arteriovenous fistulas situated anywhere in the body The fact that the bruit is heard best over the upper part of the abdomen, both anteriorly and posteriorly, does not necessarily localize it to the kidney Arteriovenous fistulas in the hepatic, splenic, and other arteries may cause a bruit which simulates that of an arteriovenous fistula of the kidney The bruit may be loudest anteriorly, laterally, or posteriorly, and a thrill is virtually always palpable

Basically, it appears that consideration of the diagnosis of an intra-abdominal arteriovenous fistula is not justified in the absence of a bruit As a rule, a bruit is not discovered unless the examiner is seeking it, since the practice of brief auscultation of the abdomen during physical examination seems to be commonly neglected When should the examiner *look* for a bruit? He should do so in the presence of unexplained hypertension, unexplained cardiomegaly, or heart failure Fortuitous discovery of the bruit may occur when the attention of the physician is drawn to the abdomen because of abdominal pain or hematuria

Hypertension.—The presence of the afore-mentioned bruit plus hypertension, particularly with an elevated diastolic pressure, may be considered pathognomonic of arteriovenous fistula of the kidney (Peripheral [peripheral, as here used, includes all arteriovenous fistulas except those encountered in the thoracic cavity] fistulas are characterized by a somewhat low or normal systolic pressure and a mild-to-marked reduction in diastolic pressure)

The blood pressure was recorded in 12 of the 15 cases and was elevated in 11 patients In five, the diastolic value was high (110 to 130 mm Hg), with elevated systolic readings and funduscopic changes to group 4

Among the remaining 7 of the 12 patients the blood pressure was only mildly elevated, a finding which would seem insignificant except for the following observations First, a fistula allowing arterial blood to escape into the venous system reasonably would be expected to produce lowering of both systolic and diastolic pressures Second, cardiac enlargement, frequently to a marked degree, was noted in 11 of the 12 above-mentioned patients, usually accompanied by heart failure [1] Such clinical findings do not consistently result from these seemingly benign forms of hypertension It is in just such a patient that an arteriovenous fistula should be sought

The cause for the often early and rapid development of cardiac enlargement and heart failure, particularly in those patients whose blood pressure is in the twilight zone between the so-called high normal and actual minimal hypertension, obviously cannot be explained on the basis of the blood pres-

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sure alone Additional factors are present, the fundamental nature of which is only partially understood

Preoperative and postoperative blood pressures were recorded in nine cases, and in all but one patient the pressure returned to normal after operation Even in the one exception the heart failure was relieved, and the ocular fundus and size of the heart returned to normal

Cardiac Enlargement—The size of the heart was recorded by roentgenogram in 12 of the patients All but one had cardiac enlargement, and in this patient the fistula, which appeared to have been present for only six months, was of malignant origin

After removal of the kidney and its accompanying vascular anomaly, the size of the heart returned to normal in all patients except the one whose hypertension had persisted Even in that patient the size of the heart decreased significantly, and the previously intractable heart failure abated spontaneously

Although, obviously, there are exceptions, most peripheral arteriovenous fistulas are not accompanied by enlarged hearts Elkin and Warren[2] studied 400 cases of peripheral arteriovenous fistulas and found only *occasional* mild enlargement and *no* instances of heart failure This fact relates to the basic concepts concerning arteriovenous shunts, namely (1) the size of the communication which quantitates the *amount* of flow, and (2) the *duration* of the shunt Peripheral defects, being *easily detected, usually are repaired soon after* they have developed The size of the vessels involved often is a secondary factor, but the possibilities for the coexistence of a *large* fistula and a *large* shunt obviously are to be found only in larger vessels Additional factors are operative in the case of renal fistulas, as will be explained shortly These added factors make arteriovenous fistulas of the kidney a disease much different from peripheral arteriovenous fistulas

Heart Failure—Congestive heart failure occurs so frequently in arteriovenous fistulas of the kidney that it *is an important part* of the picture It was present in 10 of the 12 cases in which the heart was mentioned in the report It was dramatically relieved by operation in every case

The reason heart failure is noted so frequently in arteriovenous fistula of the kidney is *not* the fact that these patients delay in consulting a physician or that the defect is not always sought or recognized The presence of heart failure relates to the basic concept that arteriovenous fistulas of the kidney constitute a pathophysiologic entity that is entirely different from any other type of arteriovenous fistula

Diagnostic Procedures

Excretory urograms were made for 12 of the 15 patients, and showed abnormalities in 11 In the 12th case, reported by Kirby and associates,[3] the urogram showed nothing abnormal

The fistula may be dramatically demonstrated by an aortogram This technique was first employed in 1954 to confirm the presence of an arteriovenous fistula An angiogram, made by inserting a catheter in the aorta with the tip of the catheter above the level of the kidneys, also is useful in demonstrating the lesion

Special catheterization procedures were carried out in three instances The demonstration of arterialization of the inferior vena caval blood is helpful, but the recovery of arterial blood from the renal vein should be considered diagnostic A marked reduction in the recirculation time, as shown by the indicator-dilution test, is characteristic of arteriovenous shunts Increased cardiac output should be demonstrable

The indicator-dilution curves in the presence of arteriovenous fistulas of the kidney were studied recently by Fox and Wood[4]

Comment

Although it may *seem* to the reader that the factors of cardiac enlargement and heart failure have perhaps been overemphasized, this very fact virtually categorizes some instances of arteriovenous fistula of the kidney as medical curiosities Congestive heart failure would not be expected to occur at an early age, and it would not even be anticipated that cardiac enlargement would be encountered in patients having only mild systolic hypertension Yet, congestive heart failure was present in a 22-year-old man whose blood pressure was 160 systolic and 60 diastolic mm Hg, and in others *with systolic pressures of* 160 to 180 and diastolic levels of 70 to 80 mm Hg

In the following description the factors which make these renal shunts so different from peripheral arteriovenous fistulas appear to be *obvious* (This is a superficial approach—experiments are under way which, it is hoped, will disclose the basic alterations of the normal physiology of the organism) The factor of *size* of the heart is illustrated in two of the cases previously reported[1] It was rather accurately determined that the fistula of one patient had been present for 17 years, yet at the time of operation heart failure was *not yet present* Another patient's symptoms began suddenly and progressed to severe heart failure within four months In the case of the former, *the narrowest diameter* of the fistula was 4 mm, in the latter, 8 mm

Overloading of the circulation because of high venous return and high cardiac output is characteristic of any type of arteriovenous fistula Blood volume is increased

The degree of alteration of the circulatory dynamics is proportional to (1) the size of the fistula,

(2) the gradient of pressure, and (3) the length of time the fistula has been present In the case of arteriovenous fistulas of the kidney, there are some special reasons for the production of cardiac enlargement and heart failure The pressure as well as the pulsatile character of the arterial blood in the renal artery *distal* to the fistula is decreased and, consistent with this decrease, the flow to the kidney is reduced This action produces an effect similar to that seen in a Goldblatt kidney

As hypertension develops, the pressure gradient across the fistula is increased and a vicious cycle is established The hypertension augments the flow through the fistula which tends to cause an additional increase in the cardiac output The latter, in turn, presents more blood at increasing pressures to the fistulous communication Of great importance in illustrating the significance of the renal factor in the production of the hypertension, cardiac enlargement, and heart failure is the return of these features to normal in all but one case (and this patient obtained relief from all but her hypersion)

Thus, the organism, in its attempt to maintain renal flow, sets up this vicious cycle in which failure may be of rapid onset and resistant to treatment In effect, the organism literally brings about its own destruction in its attempt to save the one ischemic kidney

Conclusions

As far as is known, this paper describes for the first time the complete clinical picture of a renal-vascular syndrome

Since the bruit which accompanies arteriovenous fistula of the kidney is so easily heard, if searched for, it becomes important to auscultate the renal and upper abdominal areas of patients who have enlarged hearts, often with heart failure, in whom the hypertension is mild enough to seem to be incompatible with these findings Auscultation also should be carried out in patients who have cardiac enlargement or failure of unknown causation, as well as in patients whose urograms demonstrate unexplained deformities and patients who have renal tumors

Further evidence that this lesion is more common than previously believed is suggested by the chronology of the reported cases Ten of the first 12 reported cases have been described during the past 11 years

A new concept of the causation of arteriovenous fistulas presumed to be "congenital" in origin has been presented [1] Evidence indicates that the essential process is erosion of a pre-existing aneurysm of the renal artery into the renal vein an action which finally produces the arteriovenous fistula

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AORTIC PULSATIONS AND GASTRIC ULCER —It is evident from these experiments that the pulsatile thrust of the aorta upon the stomach evokes ulceration of the mucosa with eventual perforation of the viscus, either into the free peritoneal cavity or directly into the aorta with establishment of a gastroaortic fistula Local venous obstruction, which has been shown to potentiate development of ulcers, is present to the same extent in all groups of animals and thus is not a determining factor Histamine hypersecretion has not decreased significantly time of appearance of the gastric ulcers

It is well known that gastric ulcer in man is accompanied frequently by a gastric juice of relatively low volume and digestive power, as compared with the larger volumes, greater acidity and peptic power of gastric juice in patients with duodenal ulcer Moreover, gastric mucosa is extraordinarily refractory to injury by the gastric juice compared with the very susceptible esophageal epithelium and with duodenal mucosa In fact, since the time of John Hunter, investigators have continually been asking themselves why does the stomach not digest itself?

In man, whether he sits, stands or lies supine, the thrust of aortic pulsations makes itself felt upon his stomach Perhaps one of the best treatments for gastric ulcer would be to have the patient assume the prone position for long periods of time whenever possible —W O Griffen Jr, and others Role of the Pulsatile Thrust of the Aorta in Genesis of Gastric Ulcer, *Proceedings of the Society of Experimental Biology and Medicine*, June, 1960 p 342

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CARDIOPULMONARY SEMANTICS

AT THE REQUEST of the National Institutes of Health, we have recently visited a number of British medical schools and hospitals The purpose was to offer an opinion concerning the advisability of a study of the reasons for the reported differences between the two countries in the frequency of disabling pulmonary and coronary disease The outstanding impression of the trip was that our British colleagues were not only splendid clinicians but delightful hosts Other impressions, which may be of interest to physicians in the United States, were as follows

A review of the published mortality statistics and other pertinent data submitted to us and our own observations lead us to the following general conclusions First, the graver forms of chronic pulmonary disease, which progress to fatal respiratory or cardiac (cor pulmonale) failure, seem to be considerably more common in England and Wales than here This is true for both sexes and for all age groups Second, and by contrast, the age-sex specific death rates from coronary heart disease are approximately twice as great in the United States as in England and Wales These differences are not explicable on the basis of variations in terminology and diagnostic categories and appear to reflect genuine differences in incidence and mortality Third, coronary disease begins to take its major toll in the 40's—particularly in males—whereas the deaths from chronic pulmonary disease loom large in the mid-50's, 60's, and on Hence, due to coronary disease, there appears in the United States an actual excess of deaths from all causes in "middle age" as compared with England and Wales, whereas the latter regions show a similar excess in older age due to the contribution from chronic pulmonary disorders

Although we had less opportunity to judge coronary disease than chronic pulmonary disease, we found that in the former the diagnostic criteria in the two countries are, in general, similar Such differences as were enco [illegible] were intranational rather than international Thus, in England, Scotland, and Wales, as in the U S A , cardiologists exhibited certain differences among themselves in their criteria for the diagnosis of angina pectoris In general, however, their criteria for this diagnosis are similar to ours, and there appeared to be no difference in the evidence deemed necessary for the diagnosis of myocardial infarction

Parallel epidemiologic studies, designed to substantiate further the validity of these apparent differences in incidence and mortality and to attempt to learn the reasons for them, are clearly indicated The possible prophylactic value of such information is obvious

Although no significant national differences in basic concepts of cardiac or pulmonary disorders were found, we did encounter marked discrepancies in terminology These, which are so striking as to confuse an American physician reading a British journal and vice versa, constitute the reason for this communication

We do not wish to enter into a debate with the shade of the late H L Mencken concerning the desirability of an American language and, in view of his renowned ability in argument, have serious doubts whether we could even hold our own with his ghost However, since science is international, it seems highly desirable that American and British physicians should be able to communicate without confusion It is hoped that a uniform terminology may be achieved in the reasonably near future In the meantime, the existing Tower of Babel situation may possibly be clarified by the following explanations of some of the differences in current usage of diagnostic terms

Chronic bronchitis To most of us in the United States this means a low-grade inflammatory process in the bronchial tree associated with a persistent cough, often related to smoking and to a chronic postnasal discharge We regard it as mainly a nuisance rather than as a disease The British apply this term to a common and potentially grave and progressive nonspecific pulmonary disease associated with bronchial hypersecretion and what we call cylindrical bronchiectasis leading, in many instances, to varying degrees of a generalized obstructive lung disease It is characterized by a cough, expectoration, dyspnea, and ultimately by respiratory or cardiac failure To us, even the most severe instances of chronic bronchitis are analogous to patients with the benign type of essential hypertension, the British usage of the term is more analogous to a slowly progressive but malignant hypertension

Bronchiectasis To the British this means a localized disease, usually confined to one or two lobes, often beginning in youth, usually following a specific acute infection such as pneumonia, associated with profuse purulent expectoration, and commonly amenable to surgical excision Thus they apply the word only to what we call "localized saccular bron chiectasis' Even when there is copious and purulent sputum, they use the phrase "chronic bronchitis to describe what we designate as 'diffuse cylindrical bronchiectasis'

Emphysema Our British colleagues believe that this should be an anatomic diagnosis and deplore our common tendency to apply the word to any patient with severe pulmonary disease who displays evidence of chronically overdistended lungs, with increase in residual air and expiratory obstruction

Asthma The distinction from chronic bronchitis and from emphysema is more sharply drawn by them than by us They insist that, although pulmonary overdistention occurs during the attacks, emphysema is an entirely separate entity They validate this view by well studied autopsy specimens In instances of 'pure" asthma, which perhaps we would call "true bronchial asthma' even of many years duration, while acute distention due largely to obstruction by mucus plugging of bronchi occurs with the acute attack, chronic pulmonary distention and destructive parenchymal changes do not occur Unless the situation is complicated by simultaneous occurrence of chronic bronchitis" of the British variety, destruction of the walls of respiratory bronchioles and other evidences of pulmonary emphysema are not found at autopsy

Cor pulmonale Here, the differences are no less intranational than international Few clinicians on either side of the Atlantic are willing to apply this expression to right ventricular failure resulting from pulmonary hypertension brought about by congenital lesions, by mitral stenosis or by left ventricular failure However, some would reserve the term for instances due to parenchymal disease of the lungs, while others would include primary pulmonary hypertension and acute or chronic pulmonary embolism as causes Some would apply cor pulmonale only to patients with overt clinical evidence of right ventricular failure, while others include right ventricular hypertrophy without failure

Coronary disease The British say ischemic heart disease,' while most Americans still employ the phrase arteriosclerotic heart disease despite its obvious disadvantages

It is not the purpose of this editorial to suggest that either nation adopt the nomenclature of the other, but rather to clarify to readers in one country the meaning of the words used in publications from the other A second purpose is to express the hope that in the long-range interest of clarity a jointly chosen terminology may eventually be adopted Since our British friends appear to be at least as much inclined toward the use of such expressions as OK" and phony' as we are toward reading of the King James version of the Bible and of Shakespeare, it seems obvious that each nation is being influenced by the culture of the other It therefore appears conceivable that a mutually satisfactory and identical medical language may ultimately be evolved

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BACTERIURIA AND CATHETERIZATION

Quantitative urine culture methods have become simple, dependable, and inexpensive during the past decade In research, they have yielded important new knowledge on the biology of urinary infections Clinically, quantitative urine cultures used in combination with in vitro drug sensitivity tests are the most accurate means available for the diagnosis and treatment of urinary infections

Bacteriuria exceeding 100,000 organisms per milliliter of urine, which has been properly collected and promptly inoculated, is almost always indicative of infection In about 80% of such instances, *bacteria are also found in the stained urinary sediment* Values of less than 1,000 microorganisms per milliliter of urine are nearly always negative in significance because they usually result from contamination or reflect the normal flora of the urethra These conclusions have been shown to be equally applicable whether specimens are collected by clean mid-stream voiding, by catheterization, or by suprapubic puncture of the bladder Results from quantitative urine cultures are so dependable that catheterization for bacteriologic diagnosis should be unnecessary in persons of any age

Application of these recent, important advances in knowledge has clearly indicated that urethral catheterization may result in contamination of the urinary tract and sometimes in pyelonephritis Significant bacteriuria appears in 2% of patients after a single catheterization, in 3% after several catheterizations, and in 98% of patients who have had indwelling urethral catheters for periods of four days or longer Not all patients with microorganisms in the bladder, however, develop pyelonephritis For example, in a group of cases at autopsy, cultures were positive in only 35% Among a group of paraplegics with indwelling catheters for periods up to 14 years, 71% remained free of demonstrable kidney disease Nevertheless, each patient with bladder bacilluria must be regarded as susceptible to pyelonephritis Microorganisms may reach the kidneys from the bladder by means of the bloodstream, the ureter, the ureteral wall, or the lymphatics

In a study appearing in this issue of The Journal, p 1593, Clarke showed that fewer than 1% of patients with indwelling urethral catheters, after operations for bladder tumors, bladder stones, and prostatic obstructions, developed persistent significant bacteriuria, provided that relief from obstruction, tumor, or stone had been complete and provided that patients were followed up and that infections which did not disappear spontaneously were adequately treated Since it is known that renal inflammation, initiated by bacterial infection, as well as loss of function can progress after bacteriuria has subsided, the ultimate incidence of pyelonephritis in patients of the type studied cannot be stated

Meticulous catheter hygiene and, in certain cases, judicious and aseptic use of irrigants will also reduce the incidence and severity of catheter-induced bacteriuria Currently under trial are catheters impregnated during manufacture with bacteriostatic materials The indications for prophylactic use of antibacterial and antibiotic agents in patients with indwelling urethral cathers are not as yet unequivocally defined The advantages must be weighed against the possibility of emergence of drug-resistant pathogens, development of superinfections, and occurrence of toxic reactions to the drugs employed

The urethral catheter, like other surgical instruments, must be used in conformance with basic principles of surgery, which emphasize aseptic and atraumatic techniques Similar to other instruments, its proper use may be lifesaving However, urethral catheterization should not be performed without assessment of calculated risks and careful judgment as to whether such risks should be taken The physician who is responsible for infecting his patient by the thoughtless and unnecessary use of catheterization is no less culpable than the physician who denies his patient the benefit of urinary drainage by means of the catheter when it is necessary

MULTIPLICITY AND COMPLEXITY OF DRUG TERMINOLOGY

Distinctive names are essential for the identification of nearly everything with which modern society is concerned Indeed, various disciplines of knowledge and communication foster the application of several names to identical objects This is perhaps nowhere more evident, nor more complex, than in the case of names that are applied to drugs There is, moreover, considerable variation in the terms used to define the different kinds of names for drugs Thus, substances which have been chemically isolated are usually known individually by at least three types of names (1) a precise chemical designation, sometimes loosely called the "formula," which is derived from the structure of the compound, and which may vary according to the system of chemical nomenclature used, (2) a nonproprietary (common, free, generic, official, trivial, unprotected) name, which is devised as a short, descriptive designation, generally so as to bear some resemblance to the chemical or biological characteristics of the compound, and which is intended for unrestricted general use, (3) a proprietary (brand, protected, trade) name, which is applied exclusively by one manufacturer or distributor to identify the owner's particular preparation or preparations, and which may or may not be registered as a trademark

In the case of chemically undefined biologic substances, such as wholly or partly purified extracts of plant or animal tissues, including immune sera and vaccines, a specific description of their derivation and/or assay is used in lieu of a chemical name Such descriptions, as well as chemical names, are essential in defining drugs to which nonproprietary and trade names are applied Nonproprietary names of convenient length, coined so as to reflect partially the chemical or biologic nature of the drug, are accordingly essential for designating drugs to which more than one trade name is applied, or likely to be applied, after exclusive rights to their manufacture have expired Nonproprietary names, moreover, provide a convenient means for the common identification of drugs in scientific publications throughout the world Trade names, on the other hand, serve to identify respective preparations of individual manufacturers when it is necessary to refer to, or distinguish between, particular brands

Beyond the foregoing three categories of names, there are also experimental code numbers for drugs under investigation, and abbreviations of chemical names for compounds reported in the scientific literature Thus, it will be evident that the multiplication of drug terminology arises from the use of different designations for different purposes at different times

Much of the current confusion in drug terminology is occasioned by a lack of uniformity in its application by manufacturers, investigators, and editors of reports published in the medical literature Whether or not a proprietary name is applied, manufacturers are required by federal law to label drug products with a "common or usual" name If a product purports to be a preparation included in the U S Pharmacopeia or the National Formulary, the labeling must bear the nonproprietary designations of these publications, usually referred to as the "official" name In the case of drugs for which "official" standards have not been included in these publications, the law permits a manufacturer to use whatever existing generic terminology has been established as "common or usual" This may be either a complex chemical name or whatever other nonproprietary name has been introduced into the literature Preferably, the generic identification of drugs should be accomplished by short, pronounceable nonproprietary designations which have been voluntarily established in cooperation with a recognized responsible agency such as the AMA Council on Drugs or the World Health Organization

For the most part, American manufacturers cooperate closely with the AMA Council on Drugs in the early adoption of relatively short descriptive nonproprietary names for new drugs. When this is done before scientific papers are published and labels for new drugs are printed, convenient nonproprietary terminology can be readily established as the "common or usual" name of a new drug. Early establishment of recognized nonproprietary names should obviate the unfortunate use of complex chemical names in clinical reports and on labels of drugs. The Council believes that such names tend to diminish confusion, however, the Council also recognizes the usefulness of trademarks for the physician who wishes to prescribe, or refer to, some particular brand. The Council cooperates with the U. S. Pharmacopeia, the National Formulary, the National Institutes of Health, the World Health Organization, the British Pharmacopeia Commission, and the French Codex in the consideration of U. S. industry-proposed nonproprietary names in an effort to avoid, whenever possible, the introduction of different generic names for the same drug by different agencies or by different countries. Many manufacturers consider the conjunctive display of nonproprietary terminology essential to the "protection" of trade names, which otherwise may lose their proprietary status. Aspirin, a former trade name, has become a common name for acetylsalicylic acid because of failure to associate it with a nonproprietary designation. Although a few manufacturers have persisted in using a complex chemical designation or an unrecognized unwieldy nonproprietary name in conjunction with trade names for new drugs, the attitude of the industry as a whole has improved in the application of simplified nonproprietary names. Short nonproprietary designations are (*a*) better suited for labels of small package drugs which also carry a trade name, (*b*) more convenient than chemical names for medical writing and speaking, and (*c*) essential to avoid confusion as well as discrimination in the description of a drug for which there is more than one trade name. Despite industry cooperation in this area, there is occasional commercial opposition to the suggestion that nonproprietary names be short as well as descriptive of the chemical relationship which new compounds may bear to older drugs.

The plethora of trade names for different preparations of the same drug has also compounded the confusion in drug terminology. That each manufacturer may properly apply a trade name to each new chemical compound which he has developed for clinical use is hardly open to criticism under the traditional American system of free enterprise. Unfortunately, manufacturers have not found it feasible to limit the application of trade names to individual new compounds. Indeed, several trade names are sometimes applied by one manufacturer to identify the various dosage forms of the same drug. For example, instead of applying a trademark such as Avalon to all preparations of a given drug so that these might be rationally designated and prescribed as Avalon tablets, Avalon inhalant, and Avalon injection, it is not unusual for a manufacturer to identify them by three different trademarks such as Avatabs, Avahalant, and Avaject. Sometimes an initial trademark such as Avalon is applied to only one preparation, such as tablets, and additional trade names such as Halavon and Jectavon are applied to the subsequently introduced inhalant and injectable preparation respectively. This practice is all the more disturbing because it has been encouraged by physicians who are too busy to write or learn more than one word for each and every drug preparation. Surely such over-multiplication of trade names can be diminished by more sparing application and use by manufacturers as well as by physicians. The difficulty in coining new words that can be trademarked has already encouraged the introduction of letters and numbers as trade names. One shudders when contemplating the dangerous confusion that could arise if a carelessly written name such at AT-17 were mistaken for Al-19.

It should be emphasized that the confusion, which arises from the avoidable and unavoidable application of multiple names to drugs, could be greatly minimized by a more insistent effort on the part of editors of medical publications to give adequate display to recognized nonproprietary names in the titles and texts of all published reports on drugs. Trade names should be shown parenthetically or in a footnote the first time the drug is mentioned in the text of reports. Chemical designations, not understood by many physicians, need not be included—except in publications for reference—if a recognized nonproprietary name is available, and only when reporting on a previously undescribed agent or on some phase of its chemical structure. The AMA Council on Drugs describes all drugs by nonproprietary terminology and includes, as a matter of policy, all known U. S. trade names the first time a drug is mentioned in its statements and reports on drugs whenever the nonproprietary terminology is not considered to be generally well-known.

PLASMA VOLUME EXPANDERS

Although the misconceptions and errors associated with the use of human plasma have resulted in some unfortunate experiences, these experiences should not be permitted, by themselves, to obscure the desirability and value of human plasma for the treatment of the injured. The major misadventures associated with the use of human plasma appear to have resulted, for the most part, from overcredulous, undercritical, and premature acceptance of doctrines, procedures, and practices which frequently were proposed without sufficient experimental verification of their soundness or without recognition of their potential hazards Comprehension of the mechanisms of these errors and misconceptions should provide a valuable means for avoiding similar regrettable experiences in the future acceptance and use, not only of plasma volume expanders of human origin but also of plasma volume expanders from other sources This is discussed on p 1617 of this issue

Ignorance regarding the etiologic agent of serum hepatitis appears to be the major obstruction to progress in the development of new human plasma volume expanders The lack of knowledge concerning the identity of this agent, the lack of an experimental model other than man in which the disease may be studied in the laboratory, and the lack of a specific means for identifying carriers of this disease are serious deficiencies which hamper the testing of all new human plasma products and place the life of every patient who receives a blood transfusion in a calculable degree of jeopardy Recognition of the risk of serious morbidity and of the appreciable mortality rate of serum hepatitis has rendered the testing of new human plasmas in human volunteers practically unjustifiable The availability of reasonably safe human plasmas, as well as artificial plasma volume expanders and blood, renders the clinical evaluation of unknown plasma volume expanders of human origin increasingly difficult to sanction

The fact that none of the natural or artificial plasma volume expanders now available is considered completely satisfactory makes continued attempts to develop better plasma volume expanders highly desirable However, until at least some of the listed deficiencies in our knowledge of serum hepatitis are eliminated, the likelihood of resolving the impasse concerning human plasmas is small That success in prevention and treatment of a disease is inclined to follow rather than precede identification of the etiologic agent and understanding of the pathology and the mode of transmission is a well-known and characteristic sequence of events which might be considered an aphorism applicable to many, and probably to most, diseases The deficiencies in our knowledge of serum hepatitis create great opportunities for original thinking and imaginative investigation

Although human plasma solutions appear to be the most physiological and suitable plasma volume expanders available, efforts should continue to develop inexpensive plasma volume expanders which do not depend upon the human as their source, which have a long shelf life, and which give satisfactory and physiological therapeutic effects without resulting in antigenicity, defects in the coagulation mechanisms of the blood, prolonged storage of the expander in organs or tissues, or other undesirable side-effects Achievement of this objective appears to be the only accomplishment which might justify reduced interest in human plasma and in programs to build and maintain a national stockpile of satisfactory plasma expanders of human origin

IDIOPATHIC RETROPERITONEAL FIBROSIS

Increasing numbers of reports in recent years have called attention to a rather bizarre disease entity in which one or, typically, both ureters are obstructed by fibrous tissue surrounding them in the retroperitoneal space This subject is presented in this issue of THE JOURNAL by Simon and Nygaard, p 1569 Etiology of the fibrosis has resisted definition although a variety of hypotheses have been advanced Confinement of such fibrous tissue to its retroperitoneal location may well be explained by the presence of *retroperitoneal facia*, as described by Daselar and Anson, which encloses the abdominal aorta, vena cava, and both upper urinary tracts Certainly the most common location of the fibrous mat, namely, overlying the great vessels from above their bifurcation at the level of the second and third lumbar vertebrae and extending inferiorly below the bifurcation of the iliac vessels, is in accord with this anatomical observation The relationship of such similar entities as *periureteritis plastica* in which the ureters are encased in a cuff of fibrous tissue, or perirenal fascitis in which the kidneys are enveloped by similar tissue, is purely speculative

The disease complex presents no characteristic or diagnostic clinical picture Symptoms are generally lacking until ureteral obstruction becomes manifest and are then only a reflection of this obstruction Urographic study, either excretory or retrograde, may suggest the correct diagnosis, particularly if bilateral involvement with medial deviation of the ureters is noted However, in most instances the diagnosis is established only at the time of surgical exploration A variety of therapeutic endeavors have been reported, but best results have followed ureterolysis, with or without preliminary nephrostomy It appears that, as suggested by Raper, the fibrous tissue obstructs the ureter not so much by compression as by forming a rigid encasement about the ureter which interferes with normal peristalsis Freeing the ureter renders normal transport of the urine possible Since the disease is usually bilateral, exploration of both ureters is advisable Excision of the fibrous tissue is rarely feasible or necessary Recurrence of difficulty after successful ureterolysis has not been reported to date, the inflammatory process is presumably self-limiting

As attention becomes directed toward this rather bizarre clinical entity we may anticipate that more cases will be recognized and reported, and that further efforts will be made to determine the origin of the fibrous tissue It may well be that a variety of antecedent conditions can produce the same or similar end results with the unique localization of the reaction being determined by anatomical boundaries as previously mentioned To date, an all embracing etiologic concept has resisted clear-cut delineation

THE JUXTAGLOMERULAR APPARATUS IN EXPERIMENTAL HYPERTENSION

Tobian[1] presents an interesting discussion of the rolē of the juxtaglomerular (JG) apparatus in experimental renal hypertension, the phenomenon of hypergranulation and of degranulation of the JG cells, and the probable function of these cells in the secretion of renin"

The pathogenesis of renal hypertension has not been completely elucidated Goldblatt has demonstrated that hypertension can be produced by partial constriction of the renal artery, and the kidney can still retain good excretory function Investigators in this field turned their attention to the anatomical structures of the kidney Ruyter in 1925 described cells located in the walls of the afferent preglomerular renal arterioles Oberling in 1927 described these cells in man Goormaghtigh was first, some 20 years ago, to study the relation of these cells to hypertension The JG cells contain discrete granules These granules are particularly distinct when stained by the method developed by the Hartrofts Goormaghtigh speculated that these granules secreted a vasopressor substance Tobian points out that because these cells are actually in the wall of the afferent arteriole, they are in anatomical position to appreciate changes in the stretch of the arterial wall They probably act as stretch receptors

Tobian observed in numerous experiments in rats that degranulation of the JG cells occurs whenever the pressure in the renal arterial system becomes elevated and, conversely, that the granularity of JG cells increases in situations in which the pressure in the arterial system is reduced either as a result of applying a clip or from "curing" the hypertension

A method of estimating the degree of granularity of the JG cells was developed by the Hartrofts A fairly large histologic section of the kidney is systematically scanned, and the number of glomeruli encountered is related to the number and granularity of the JG cells observed The JG index then estimates the abundance and granularity of the JG cells If a rat becomes hypertensive as a result of a clip being placed on one renal artery, the granularity of the JG cells doubles in the clipped kidney while the granules disappear almost completely in the contralateral 'untouched' kidney

Tobian further states that the JG cells can be demonstrated to react in perfusion experiments, they also respond to variations in the amount of mineralocorticoids in the body as well as to varying amounts of sodium chloride in the diet In studying the physiological function of the JG cells, Tobian calls attention to the fact that renin was found only in the areas of the kidney which contain glomeruli and not in purely tubular areas Likewise, renin was found only in the vicinity of glomeruli but not in the glomerular tuft itself, which indicates that renin is "extraglomerular' in location There seems to exist a parallelism between the amount of extractable renin in a kidney and the granularity of the JG cells The granules were also quite abundant in the JG cells of the hypertensive rats due to the clipped kidney, and there was a considerable amount of extractable renin in these clipped kidneys It appears that renin or its precursor is located in the JG cells Tobian concludes that renin or its precursor is probably the substance secreted by the JG cells

The reactivity of the JG cells to various physiological stimuli strongly suggests that they have some highly important regulatory function

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[1] L Tobian M D Juxtaglomerular Apparatus in Experimental Hypertension *Hypertension* vol 8 pp 7-20

MEDICINE BY SHAKESPEARE

The plays of Shakespeare (1564-1616), whether composed by the Bard of Avon or an unidentified genius, as claimed by some, are as rich in medical references as in legal statements, moral philosophy, or coeval commonsense According to Robert Simpson, there are more than 400 major and 300 minor references to medical subjects in the total works of Shakespeare[1] The first comprehensive discussion of medicine in Shakespeare was prepared by John Bucknill and published in 1860 Other communications since then have either plagiarized extensively on Bucknill or have been less pretentious monographs Simpson has carried on a century later and has interpreted the many references to medicine in a contemporary environment Equally important has been the attempt to avoid repetitive errors and false interpretations that tend to be passed on from generation to generation without critical verification Every effort has been made to straighten the record

Shakespeare was prone to create a medical situation at a critical point in his play or to expound a cliché to emphasize a scene The first medical exposition by Shakespeare that I recall from grammar school days is the Seven Ages of Man from *As You Like It* There are several references to gout that have interested me in recent years I have discovered no references by Shakespeare to medicine that are unpleasant or distasteful Since his writings are almost as widely disseminated as the

Bible, scarcely a home, a library on a ship, or a bookshelf in a small inn is without a copy Rereading of Shakespeare is usually more rewarding than the reading of most of the novels on the shelves

Medicine, during Shakespeare's productive years, was just emerging from the Middle Ages Harvey had not yet described his concept of the circulation of blood, this was not reported until the year of Shakespeare's death Paracelsus had rejected the teachings of Galen, and Ambroise Paré had made his contributions, but the four humors of Hippocrates were still in vogue and the diagnosis of disease from examination of the urine, as proposed by Richard of England (circa 1250), was the accepted medical practice

> "*Speed* these follies are within you, and shine through you like the water in an urinal, that not an eye, that sees you, but is a physician to comment on your malady"
>
> *Two Gentlemen of Verona*, II, 1

Priests and monks were forbidden by Henry VIII to visit patients at home Examination and recommendation for treatment by these lay personnel could be practiced only out of the sight of the patient, hence the exploitation of the visual examination of urine A lithograph by Dou of the physician examining the urine hangs in my office The original oil painting is in the Art Museum in Vienna Early in the 17th century The College of Physicians issued a decree against diagnosis of disease from this remote type of examination Thereafter it was lawful to diagnose only in the presence of the patient

Shakespeare put in the mouth of Sir John Falstaff a number of medical references or aphorisms

> "*Falstaff* A pox of this gout! or, a gout of this pox! for the one or the other plays the rogue with my great toe"
>
> *2 Henry IV*, I, 2

The death of Falstaff is highly suggestive of a malignant fever, possibly typhoid fever, as noted by Simpson

> "*Hostess* As ever you came of women, come in quickly to Sir John Ah, poor heart! he is so shaked of a burning quotidian tertian that it is most lamentable to behold Sweet men, come to him"
>
> *Henry V*, II, 1

Shakespeare did not introduce doctors as characters until a prospective son-in-law, Dr John Hall, established his practice in Stratford-on-Avon Hall married Shakespeare's favorite daughter in 1607

Dr Caius (*Merry Wives of Windsor*) was possibly named after John Caius, the founder of Caius College, Cambridge, and physician to Edward VI, Queen Mary and Queen Elizabeth I His namesake in the play was Court Physician at Windsor

The Bard was conversant with the ways of women of easy virtue and the consequences of intimate association

"*Timon* Consumptions sow
In hollow bones of man, strike their sharp shins,
And mar men's spurring Crack the lawyer's voice,
That he may never more false title plead,
Nor sound his quillets shrilly hoar the flamen,
That scolds against the quality of flesh
And not believes himself down with the nose,
Down with it flat, take the bridge quite away—plague all,
That your activity may defeat and quell
The source of all erection There's more gold
Do you damn others, and let this damn you,
And ditches grave you all!"

Timon of Athens, IV, 3

For all those doctors who delude themselves by saying, "It can't happen to me!", Shakespeare has a word of advice

"By medicine life may be prolong'd, yet death
Will seize the doctor too"

Cymbeline, V, 5

The description of The Seven Ages of Man is, in my opinion, one of Shakespeare's best medical references

"*Jacques* All the world's a stage,
And all the men and women merely players,
They have their exits and their entrances,
And one man in his time plays many parts,
His acts being seven ages At first the infant,
Mewling and puking in the nurse's arms
And then the whining school-boy, with his satchel
And shining morning face, creeping like snail
Unwillingly to school And then the lover,
Sighing like furnace, with a woeful ballad
Made to his mistress' eyebrow Then a soldier
Full of strange oaths, and bearded like the pard,
Jealous in honour, sudden and quick in quarrel,
Seeking the bubble reputation
Even in the cannon's mouth And then the justice
In fair round belly with good capon lin'd,
With eyes severe and beard of formal cut,
Full of wise saws and modern instances,
And so he plays his part The sixth age shifts
Into the lean and slipper'd pantaloon,
With spectacles on nose and pouch on side,
His youthful hose, well sav'd a world too wide
For his shrunk shank, and his big manly voice,
Turning again toward childish treble, pipes
And whistles in his sound Last scene of all,
That ends this strange eventful history,
Is second childishness and mere oblivion,
Sans teeth, sans eyes, sans taste, sans every thing"

As You Like It, II, 7

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1 Simpson, R R Shakespeare and Medicine London E & S Livingstone Ltd , 1959

CLINICAL NOTES

Arrhythmias and Cardiac Arrest Induced By Metaraminol (Aramine) Bitartrate

Orson Smith, M.D , and Bruce Logue, M.D , Atlanta

The use of vasopressor agents for the treatment of hypotensive states has become widespread The introduction of mephentermine, metaraminol, and methoxamine, agents that can be given either intravenously or intramuscularly, has further encouraged this trend[1] The value of these agents is unquestioned and many lives have been saved through their use However, the use of pressor amines is accompanied by the possibility of producing arrhythmias The present case report concerns the production of serious atrial and ventricular arrhythmias and, indeed, cardiac arrest by the intravenous administration of 10 mg of metaraminol (Aramine) bitartrate

Report of a Case

A 49-year-old housewife was admitted to Emory University Hospital Dec 2, 1959 for elective gastrotomy She had been hospitalized two months previously with pneumonia of the lower lobe of the right lung At that time, she complained of some discomfort in the epigastrium and a gastrointestinal series showed what appeared to be ectopic pancreatic tissue in the pyloric antrum

There was no history of angina pectoris or other heart disease, although there was a tendency for the patient to deny symptoms

Physical examination on admission revealed a pulse rate of 80 and blood pressure of 100/64 mm Hg No abnormalities were noted, except for a slight tenderness in the epigastrium The heart was not enlarged and there were no murmurs or other abnormalities The preoperative electrocardiogram was within normal limits, except for rather poor progression of R waves from V_1 to V_3 The following day a gastrotomy was performed, with the removal of a gastric polyp On the patient s arrival in the recovery room the blood pressure was 100/80 mm Hg pulse rate 84, and the patient appeared in no distress Three hours later her blood pressure had fallen to 84/50 mm Hg but the pulse rate was 64 and she was warm and dry Because of the hypotension she was given 7½ grains (486 mg) of caffeine sodium benzoate intravenously without response, 10 mg of metaraminol was then given undiluted intravenously The patient immediately developed a severe headache, nausea, and vomiting, and blood pressure was 170 mm Hg systolic The pulse became rapid and irregular and then, abruptly, became unobtainable No heart sounds could be heard and the patient lost consciousness for approximately five seconds After two sharp blows to the precordium, the pulse returned but was grossly irregular An electrocardiogram taken approximately five minutes later showed multiple arrhythmias (fig 1) No medicaments were given until sinus rhythm ensued when atropine 1/75 grain (0 86 mg) was given intravenously The patient remained hypotensive, with blood pressures ranging between 70 and 80 mm Hg systolic and 50 and 60 mm Hg diastolic In spite of this, her pulse remained slow and she appeared warm, dry, and in no distress The following day a loud pericardial friction rub was present The clinical impression was that she had a myocardial infarction This was substantiated by the electrocardiogram of Dec 12, 1959 (fig 2) The remainder of the hospital course was uneventful and when seen on follow-up one month later she had no complaints The blood pressure was still 80/60 mm Hg

Comment

It was felt that the patient sustained an acute myocardial infarction either during surgery or during the immediate postoperative period It is well known that the hypoxic myocardium is subject to ectopic rhythms In addition, Maling and Moran[2] demonstrated that after experimental coronary occlusion in dogs there was an increased frequency of ectopic beats following the administration of epinephrine and norepinephrine Both "spontaneous" and drug-induced ventricular arrhythmias were maximal up to 24 hours after occlusion, but spontaneous ectopic activity generally disappeared after about four days However, the exaggerated response to the amines lasted for 12 days In contrast, methoxamine (Vasoxyl), a pressor amine with almost purely peripheral action, caused only reflex bradycardia and isoproterenol (Isuprel), a vasopressor drug which stimulates the myocardium, produced sinus acceleration but no ectopic beats They postulate that drugs that simultaneously slow the sinus rate via the carotid sinus reflex and stimulate the myocardium are particularly prone to produce ectopic rhythms

Sympathomimetic amines in normal subjects have been shown to induce reflex bradycardia and also have the effects of increasing automatic myocardial response[3] Before receiving this drug the patient was hypotensive, with a slow pulse rate If the amine then produced further depression of automatic sinoauricular response via the carotid sinus and at the same time increased automatic auricular and ventricular response, the production of ectopic rhythm would be especially prone to occur It is

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probable that reflex stimulation of the vagus induced cardiac arrest followed by the multiple arrhythmias.

In this case metaraminol, 10 mg., was given undiluted in the vein. A factor in the arrhythmia-producing toxicity of the pressor amines may be

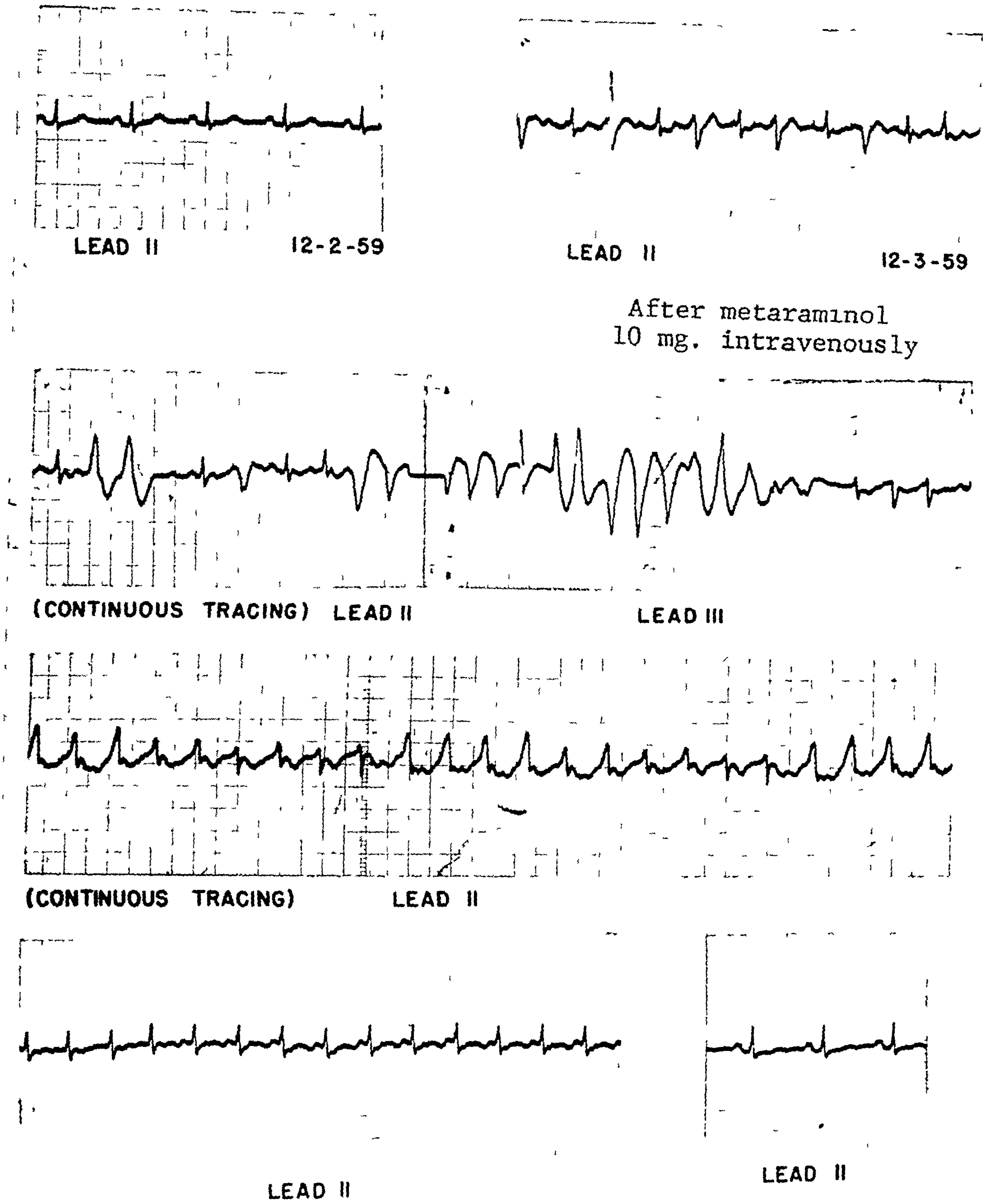

Fig. 1.—Preoperative electrocardiogram showing normal sinus rhythm with P-R interval of 0.18 seconds. Continuous tracing taken after episode of cardiac arrest shows atrial flutter with atrioventricular dissociation and frequent premature ventricular contractions arising from multiple foci, followed by run of impure ventricular flutter which spontaneously reverts to atrial fibrillation. Atrial flutter with atrioventricular dissociation and aberrant conduction then supervenes. Atrial flutter with 2:1 block develops, followed by spontaneous return to normal sinus rhythm.

the mode and speed of administration Hoffman, and colleagues,[4] noted in vagotomized dogs a definite period of increased ventricular vulnerability lasting one to three minutes after norepinephrine was infused rapidly Indeed, the fibrillation threshold was lowered to nearly that of the previous singular ventricular response threshold This effect was not noted if the drug was given slowly For this reason, if a pressor amine is to be used it would seem best to infuse slowly the smallest dose that obtains a desired effect Such is probably best done with an intravenous drip The intramuscular route, due to slow absorption, obviates this danger

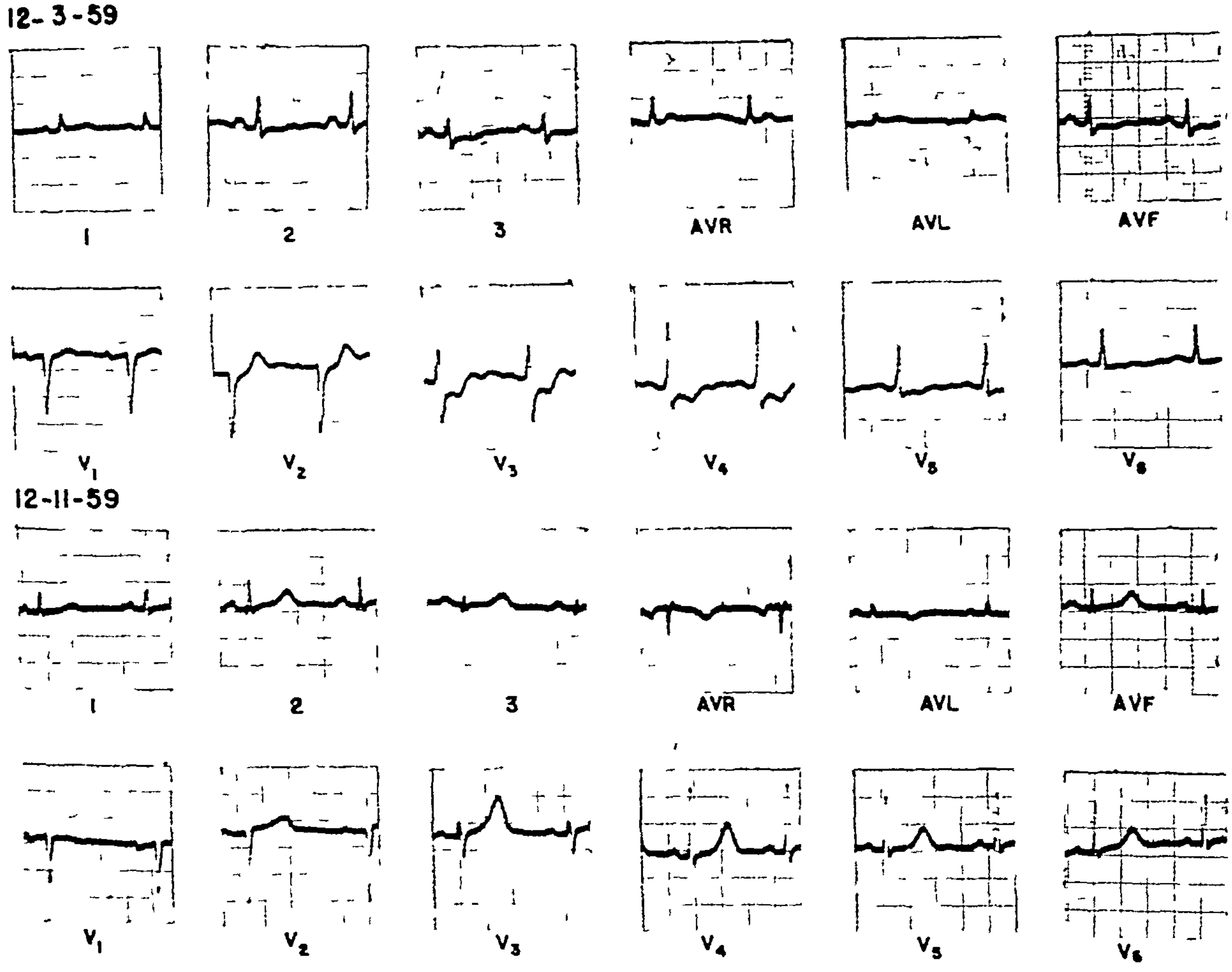

Fig 2 —Tracing dated Dec 3, 1959, taken immediately after cessation of multiple arrhythmias Previously mentioned poor R waves in V_1 and V_2 now absent There is now marked subendocardial injury and ischemia In follow-up tracing of Dec 11, 1959, striking change has occurred in initial forces of QRS, with small Q wave in leads 2, 3, and aVF In addition, there has been some alteration in terminal forces of QRS with small S wave in lead 1 Small R wave is now present in V_1 and V_2 T waves are peaked across mid-precordium to greater degree than in preoperative tracing (Although perhaps not diagnostic, it was felt that these changes were compatible with an inferior myocardial infarction, perhaps superimposed on an old anteroseptal infarction)

Littler, and co-workers,[5] infused norepinephrine into anesthetized rheusus monkeys and produced various arrhythmias, notably nodal rhythm, atrioventricular dissociation, ventricular extrasystoles, and ventricular tachycardia This effect was blocked by prior administration of large doses of atropine They also show tracings of a patient who was in shock, with a pulse rate of 55 Norepinephrine was infused and runs of ventricular tachycardia developed When the infusion was stopped, the ectopic rhythm also ceased but atrioventricular dissociation was present This suggests that prior depression of automatic sinoauricular response via the vagus is a principal factor in the emergence of ventricular arrhythmias with pressor amines Atropine in doses of 1/100 to 1/75 grain intramuscularly prior to the administration of a pressor drug might be used as protection against arrhythmia, particularly if the initial rate is slow Larger doses, such as 1/60 grain may on occasion produce dangerous tachycardia It is well known that ventricular fibrillation may be induced in the hypoxic myocardium by excessive doses of norepinephrine.[5]

Summary

The administration of 10 mg. of metaraminol (Aramine) intravenously induced cardiac arrest in a patient who was hypotensive following surgery. The potential dangers of large doses of pressor drugs in the presence of reflex increase in vagal tone should be emphasized. In the present report, myocardial infarction occurred during surgery or in the immediate postoperative period and may have contributed to the occurrence of multiple arrhythmias which followed the transient period of arrest.

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Pseudoalbuminuria Due To Bunamiodyl

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Pseudoalbuminuria in conjunction with the use of orally administered gallbladder contrast media, as first reported by Seedorf and others in 1950[1] and in subsequent papers,[2-5] is well established. The introduction of a new contrast medium, bunamiodyl (Orabilex) and its adoption for general use in our hospital in 1959 prompted the present study. The chemical formula of bunamiodyl is 3(3-butyryl-amino-2,4,6-triiodophenyl)-2-ethyl sodium acrylate. It contains 57% iodine in organic form. It is somewhat soluble in water, and excretion is largely renal.

A series of 100 patients was tested. Menstruating women, as well as patients with true albuminuria and urinary infections, were excluded. The standard dosage for each patient was 6 capsules (4.5 Gm.) of bunamiodyl. Inasmuch as the routine laboratory procedure in this hospital for detection of albumin is the use of sulfosalicylic acid and effervescent base, this was the method chosen. A solution of 4 tablets dissolved in 30 cc. of water was used. This was then combined with an equal amount of urine (not less than ten drops each). The amount of precipitate was graded as follows: trace, 1+, 2+, 3+, and 4+. Urine specimens were obtained the day preceding the gallbladder examination before ingestion of the medium, the morning of the gallbladder examination, and the following morning. However, positive reactors were tested daily until clear. Each positive test sample was heated, and the turbidity disappeared. This would not be expected with true albuminuria.

Of the 100 patients in the series 53 were female and 47 were male. Their combined average age was 46.4 years. The average age of women was 44.4 years and of men, 48.5 years.

Of the 100 patients 17 had positive reactions for albumin. Of the 17, 11 were women and 6 were men. The average age of these women was 45.5 years and of these men 51 years. Specimens from 14 patients exhibited a trace or 1+ reaction, and in 3 cases the reaction was 2+. On the day of ingestion of medium all reactions were negative; on the day of gallbladder examination there were 17 positive reactions. Only three patients had positive reactions on the day following roentgenographic examination, but all reactions were negative the subsequent day.

No correlation was found between the occurrence of pseudoalbuminuria and that of gallbladder disease as interpreted by roentgenographic diagnosis. Gallbladder concentration was excellent, with no evidence of gallstones, in all 17 patients. Age was not a significant factor in the results, but more females than males had positive reactions (ratio 1.62:1.0). Seedorf suggested that the greater average weight of males might result in a lower incidence of positive reactions.

Summary and Conclusions

Seventeen of 100 patients developed pseudo albuminuria after ingestion of 4.5 Gm. of bunamio-

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dyl The albumin disappeared with heating which would not be expected with serum albumin Age of patients was not a significant factor There was a slightly higher incidence in females The presence or absence of gallbladder disease did not affect the incidence of pseudoalbuminuria The diagnosis of albuminuria in patients who have received bunamiodyl within the preceding four to five days should be guarded, and appropriate steps should be taken to rule out the possibility of pseudoalbuminuria due to this orally given gallbladder contrast medium

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Obstructive Uropathy

Importance of Its Early Recognition

William T Bowles, M.D, and Justin J Cordonnier, M.D., St Louis

In recent years there has been a renewed interest in the disease pyelonephritis The role of the indwelling catheter, the cystoscope, and retrograde pyelography in the production of bacteriuria and pyelonephritis has been well emphasized As a consequence, the fear of initiating active renal infection has led to new methods of obtaining and interpreting voided urine specimens in order to avoid catheterization for diagnostic purposes However, along with this fear has developed a tendency to limit the use of tools which for many years have aided the physician in making the diagnosis of obstructive uropathy, a disease often equally as serious in consequence to the patient as pyelonephritis itself

The following three cases, seen recently in consultation by the urology service, emphasize the importance of considering obstruction in all cases of urinary infection and azotemia and using the diagnostic tools available when indicated as early as possible

Report of Cases

Case 1 —A 58-year-old woman was admitted to the medical service complaining of vomiting, weakness, and weight loss for the previous two months She had been admitted to another hospital two weeks prior to the present admission, where she received two blood transfusions for anemia The patient had been a known diabetic for 14 years but had received no diabetic therapy for the past 3 years Her weight had declined from 250 to 145 lb (114 to 66 kg) in five years without dietary restriction There was no previous history of renal disease except for the complaint of dysuria for the previous two weeks Examination showed a chronically ill woman with scaly skin The blood pressure was 140/90 mm Hg, pulse 100 per minute, and temperature 37 C (99 F) The fundi showed marked arteriolar narrowing with a few capillary microaneurysms and small, waxy exudates The abdomen was pendulous and no masses could be felt Extremities showed normal sensation with no edema Pelvic examination, made by the intern, showed a tender distended mass anteriorly in the region of the bladder The laboratory examinations disclosed a hematocrit value of 30% and a normal white blood cell count Urinalysis revealed 3+ protein, negative results for sugar and acetone, and 3 red blood cells and 4 white blood cells per high power field in the centrifuged sediment The blood chemical studies showed a blood urea nitrogen level of 81 mg % and a fasting blood sugar level of 170 mg % Clean voided urine was cultured and showed a heavy growth of Escherichia coli and diphtheroids

Treatment of diabetes was initiated, and the patient was given tetracycline In the next few days the blood urea nitrogen level increased to 120 mg %, and the patient s condition rapidly deteriorated It was noted that she was becoming progressively more oliguric, repeat urinalysis showed a great increase in the number of red blood cells, and a gram

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From the Department of Surgery Section on Urology Washington University School of Medicine stain of the urine revealed vast numbers of gram-negative rods It was the consensus of opinion that the renal failure was a consequence of acute and chronic pyelonephritis, possibly superimposed on intercapillary glomerulosclerosis (Kimmelsteil-Wilson disease) The average daily urinary output had decreased to 150 to 300 cc, and the patient was semi-comatose On the 11th hospital day members of the medical renal service were consulted, and they thought that, in addition to the foregoing diagnoses, renal papillary necrosis might have existed However, they felt that an obstructive lesion should also be considered and immediately took steps to determine this possibility Consequently, on the 12th hospital day, members of the Urology Service were called in At this point the patient had passed no urine for 24 hours, her blood urea nitrogen level had reached 160 mg %, and she was receiving 50% glucose and water through an indwelling catheter in the vena cava On catheterization, 1600 cc of cloudy urine were obtained After this, cystoscopy was performed which showed an acutely inflamed bladder wall The right ureteral orifice could not be identified A ureteral catheter was passed to the left renal pelvis, and a brisk drip of urine was obtained Specimens were collected for urinalysis and culture A pyelogram was then obtained which showed a normal collecting system with 17 mm thickness of renal cortex The catheterized bladder urine showed a 4+ test for protein, innumerable white blood cells, and a few gram-negative rods The urine from the left kidney contained no protein, white blood cells, or bacteria, and culture of the urine revealed no growth Culture of the bladder urine produced a growth of 20,000 colonies of Esch coli per cubic centimeter An indwelling urethral catheter resulted in a marked diuresis, and the blood urea nitrogen level gradually fell to the admission level of approximately 80 mg % The cystitis cleared on catheter drainage, and on discharge the patient was voiding without residual urine with the help of bethanechol (Urecholine) chloride The urinalysis showed negative findings, except for scattered white blood cells This patient had serious underlying renal disease which made it difficult for her to tolerate the effects of functional obstruction due to bladder atonicity, and the latter, had it gone unrecognized, might well have proved fatal

Case 2 —A 69-year-old man was admitted to the hospital for the third time His first admission had been seven years previously for nonopaque right ureteral stones with secondary pyelonephritis He was treated with a right nephrectomy He was again seen five years later when he was admitted to the medical service because of infected urine, chills, and fever On his admission, blood urea nitrogen level was 78 mg % A large amount of residual urine was found, and, on catheter drainage and administration of antibiotics, his temperature returned to normal and blood urea nitrogen level decreased to 30 mg % An intravenous pyelogram showed a normal left kidney On cystoscopy the diagnosis of obstructing prostatic hypertrophy was made, and a transurethral prostatic resection was performed with a good result The patient was not seen again until he entered the hospital for the third time, two years later, complaining of oliguria, chills, and fever The referring physician suspected he had pneumonia, and the patient was admitted to the medical service Examination showed a blood pressure of 130/70 mm Hg, temperature of 102 F (39 C), and a pulse of 80 per minute Except for an old healed right-flank incision and a slightly enlarged liver, the remaining examination showed negative results On urinalysis, innumerable white blood cells and 1+ protein were found The hemoglobin level was 12 9 Gm, the white blood cell count was 12,700 per cubic millimeter, and the blood urea nitrogen level was 78 mg % Urine culture was obtained and showed no growth The patient was given fluids and antibiotics intravenously, and there was a gradual decrease in the blood urea nitrogen level to 17 mg %

On the 34th hospital day, the patient was noted to be slightly disoriented and the blood urea nitrogen level had suddenly increased to 63 5 mg % Two days later there was no urinary output over a 24-hour period He was catheterized and no urine was obtained from the bladder The patient's condition became progressively worse, and by the 44th day, 10 days later, when the urology department was consulted, the blood urea nitrogen level had risen to 120 mg % He had been anuric for eight days and had been receiving 50% glucose and water because he was suspected to have renal failure secondary to end-stage pyelonephritis Because of his past history, it was our opinion that the ureteral obstruction should be immediately searched for, and a ureteral catheter was passed to the left renal pelvis, after which a pyelogram showed obstruction in the lower part of the ureter, probably a nonopaque calculus The ureteral catheter was left in, and in the first six hours the urinary output was 1,900 cc In the next 24 hours, the output rose to 5,000 cc The serum potassium level fell from 8 0 to 4 0 mEq per liter Despite careful management of the diuresis, the patient died suddenly the next night No autopsy was permitted Earlier recognition of the primary lesion might have resulted in a more favorable outcome

Case 3 —A 54-year-old man entered the hospital on the medical service for the second time complaining of left-flank pain, fever, chills, frequency, and terminal dysuria His first admission, two years previously, was for treatment of congestive heart failure secondary to severe rheumatic heart disease with suspected aortic insufficiency, aortic stenosis, and mitral insufficiency His blood urea nitrogen level at the time of that admission was 60 mg %, and a flat film of the abdomen showed a small contracted right kidney with cortical calcification. He was thought to have subacute bacterial endocarditis and was treated with large doses of penicillin and streptomycin for three weeks. During this time the blood urea nitrogen level rose to 299 mg % but decreased to 90 mg % at the time of discharge. The discharge diagnosis included chronic glomerular nephritis. The patient did well on digitalis therapy for the following two years until about one month before entry, when he developed general malaise. One week before entry he noted the onset of pain in the left costovertebral angle which was associated with chills, hematuria, frequency, and terminal dysuria.

Examination on entry showed a thin, well-oriented man who appeared chronically ill. Fine moist rales were present at both lung bases. The heart was clinically enlarged, with a regular tachycardia (pulse rate 108 per minute). He had the murmurs of mitral and aortic insufficiency. The abdomen was flat with a slight left-flank tenderness and an enlarged, tender liver. Urinalysis showed only a full field of red blood cells on microscopic examination. The hemoglobin level was 8.0 Gm %. The diagnosis of left renal stone was considered, but, because of the possibility of subacute bacterial endocarditis with an embolus to the left kidney, it was decided to watch the patient. The blood urea nitrogen level on entry was 105 mg %, the phosphorus level 8.0 mg %, and the potassium level 5.5 mEq per liter. A urine culture showed negative findings. It was the feeling of the medical staff that with negative urine culture findings and already severely embarrassed renal function instrumentation of the urinary tract could not be done at that time because of the great hazard of secondary pyelonephritis. On the second hospital day, the blood urea nitrogen level had increased to 125 mg %, but the patient was somewhat improved with a regression of the left-flank pain. On the third hospital day the patient was noted to be somewhat oliguric, and the blood urea nitrogen level was then 150 mg % and the creatinine value 7.5 mg %. The urinary output for the previous 24 hours had been 300 cc.

On the fifth day, the urology service was called. The patient appeared severely ill, lethargic, and hyperpneic. A cystoscope was passed, and examination of the bladder interior revealed a red, swollen left ureteral orifice, which unfortunately could not be catheterized because of the surrounding edema. The right orifice was normal, and a catheter was passed to the right kidney. There was no excretion of urine through this catheter, and a pyelogram showed a small contracted kidney. It was felt that immediate left nephrostomy was the patient's only hope for survival, and, therefore, the patient was taken to the operating room and was given spinal anesthesia with hypobaric solution. There was a momentary fall in blood pressure which was counteracted by administration of phenylephrine (Neosynephrine) hydrochloride. A left-flank incision exposed the renal pelvis and ureter, which were seen to be tense and distended with urine. A nephrostomy was done. While the incision was being closed, the patient had a sudden cardiac arrest which could not be counteracted by massage or electrical defibrillation. Autopsy disclosed severe rheumatic heart disease and a contracted right kidney, the cortex of which was almost completely atrophied. The left kidney showed numerous small abscesses in the renal medulla. The left ureter was dilated down to the ureterovesical junction, where it was obstructed by old blood clots and a brown, gritty material. An earlier diagnosis of the existing pathology would have permitted definitive management under more favorable circumstances.

Comment

Obstruction of the urinary tract is a disease which may be mild, moderate, or extremely severe in its effect on renal function. The fact that in many cases removal of the obstructive process will result in a return of normal renal function makes it mandatory that the disease be diagnosed before irreversible changes have occurred from hydrostatic pressure and infection. In acute obstruction with anuria, the diagnosis should be made or ruled out immediately before the patient is started on therapy for acute renal insufficiency or end-stage pyelonephritis.

Several points should be emphasized. 1. Significant urinary obstruction may exist despite an adequate urinary output. 2. Anuria secondary to bilateral obstruction of the ureters by stones or tumor may not produce flank tenderness. 3. Patients whose output varies in a brief period from being excessive (diuresis) to being disproportionately small (oliguria) and then increases again despite constant fluid intake probably have intermittent urinary obstruction as a basis for their increasing azotemia. 4. The finding of one unobstructed nonfunctioning kidney does not rule out obstruction of the other kidney as a basis for anuria or oliguria (see case 3).

Pyelonephritis is indeed a serious disease, and its iatrogenic production by the overuse or misuse of genitourinary instrumentation is to be deplored. However, acute or chronic obstructive uropathy is in many cases even more serious to the patient, and its early recognition may sometimes be lifesaving.

Obviously, in patients with elevated blood urea nitrogen, the use of a noninstrumental approach such as intravenous pyelography is not practicable. Therefore, the early use of the catheter to measure residual urine and of retrograde pyelography to uncover ureteral obstruction will prevent the equally deplorable death of patients from unrecognized urinary obstruction.

4960 Audubon (Dr. Cordonnier).

DEATHS

Armstrong, James Cleland Ⓜ Waverly, Tenn , University of Tennessee College of Medicine, Memphis, 1939, interned at the Methodist Hospital in Memphis, past-president of the Benton–Humphreys Counties Medical Society, mayor of Waverly, died Aug 17, aged 52, of coronary thrombosis

Bartholomew, Philip Henry, New Castle, Del , College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; veteran of World Wars I and II, formerly associated with the U S Public Health Service, died in the Memorial Hospital, Wilmington, July 25, aged 81, of dissecting aneurysm of abdominal aorta

Bauman, John William, Nashville, Tenn , Vanderbilt University School of Medicine, Nashville, 1904, served on the faculty of his alma mater, at one time a city councilman, formerly city finance director and for many years commissioner of water, health and welfare, associated with the Vanderbilt University Hospital, died Aug 18, aged 80, of arteriosclerotic heart disease

Beardsley, Lewis George, West Haven, Conn , born in Bridgewater Dec 27, 1888, Yale University School of Medicine, New Haven, 1917, served as clinical professor of medicine at his alma mater, veteran of World Wars I and II, at one time on the staff of the Gaylord Farm Sanatorium in Wallingford, in 1954 was named the second recipient of the David Russell Lyman Medal, presented by the Gaylord Farm Association, which is made up of former patients who have overcome the handicap of tuberculosis and led a life of outstanding productiveness and service to the public welfare, for many years associated with the Veterans Administration, formerly manager of the Veterans Administration Hospital in West Haven, died Sept 5, aged 71, of hepatitis

Beason, Lewis Ⓜ Butler, Ga , Atlanta College of Physicians and Surgeons, 1912, Chattanooga Medical College, 1910, died in the Americus and Sumter County Hospital, Americus, Aug 8, aged 74, of coronary disease

Beem, Ione Fisher, Pasadena, Calif , University of Illinois College of Medicine, Chicago, 1913, member of the American Academy of Ophthalmology and Otolaryngology, for many years practiced in Chicago, died Aug 6, aged 84, of bronchopneumonia

Blackburn, Henry Martin, Grand Rapids, Mich , Vanderbilt University School of Medicine, Nashville, Tenn , 1913, fellow of the American Society of Ophthalmologic and Otolaryngologic Allergy, veteran of World War I, served on the staffs of the Blodgett Memorial and St Mary's hospitals, and the Butterworth Hospital, where he died Aug 25, aged 70, of acute endocarditis

Bremer, Charles William Ⓜ New York City, Columbia University College of Physicians and Surgeons, New York City, 1935, interned at the Gouverneur Hospital in New York City, where he served a residency at the Lenox Hill Hospital, specialist certified by the American Board of Radiology, member of the Radiological Society of North America and the American College of Radiology, associated with the Hospital for Special Surgery and the New York Hospital–Cornell Medical Center, died in the New York Hospital July 28, aged 49, of chronic pyelonephritis

Brown, Ralph Edgar Jr , Major, U S Army, retired, Columbus, Ohio, born in Columbus Nov 23, 1916, Tufts College Medical School, Boston, 1942, interned at the Rhode Island Hospital in Providence, where he served a residency, served a residency at the Middlesex County Sanatorium in Waltham, Mass , and St Francis Hospital and Sanatorium for Cardiac Children in Roslyn, N Y , veteran of World War II and was awarded the French Croix de Guerre with silver star, participated in five major campaigns in the Korean conflict and was awarded the Korean Presidential Citation, retired from the regular Army on Oct 31, 1954, certified by the National Board of Medical Examiners, specialist certified by the American Board of Surgery, fellow of the American College of Surgeons, served on the staff of the Monadnock Community Hospital in Peterborough, N H , died in the Veterans Administration Hospital in Dearborn, Mich , Aug 4, aged 43, of advanced tuberculosis with possible carcinoma of the left lung

Caswell, Leaman Henry Ⓜ Dannemora, N Y , Tufts College Medical School, Boston, 1926, veteran of World War I, medical examiner under Selective Service in Clinton County during World War II, served on the staff of the Dannemora State Hospital, associate physician at the Clinton Prison, died in the Champlain Valley Hospital, Plattsburgh, Aug 24, aged 61, of hepatic coma

Chapman, Lillie Evadell Newell, Gerber, Calif , Lincoln Memorial University Medical Department, Knoxville, Tenn , 1912, died in the Enloe Hospital, Chico, June 9, aged 82, of cardiac infarct

Cherry, James Henderson Ⓜ Galveston, Texas, born in Lewiston, N C , June 22, 1912, Duke University

School of Medicine, Durham, N C , 1933, formerly a fellow in orthopedics at the Mayo Foundation in Rochester, Minn , certified by the National Board of Medical Examiners, specialist certified by the American Board of Orthopaedic Surgery, member of the American Academy of Orthopaedic Surgeons, fellow of the International College of Surgeons and the American College of Surgeons, associated with St Mary's Infirmary in Galveston, formerly practiced in Asheville, N C , where he was associated with Memorial Mission, Aston Park, St Joseph's, and Asheville Orthopedic hospitals, served on the staffs of the Veterans Administration Hospital in Oteen, N C , and the Veterans Administration Hospital in Swannanoa, N C , consultant, St Luke's Hospital in Tryon, N C , Marion General Hospital in Marion, N C , and the Angel Clinic–Hospital in Franklin, N C , an orthopedic consultant for the crippled children s division of the North Carolina State Board of Health, veteran of World War II, died Aug 28, aged 48, of cirrhosis of the liver

Cate, William Robert Jr Ⓜ Murfreesboro, Tenn , born in Songdo, Korea, Aug 3, 1922, Vanderbilt University School of Medicine, Nashville, 1945, interned at the Barnes Hospital in St Louis, where he served a residency, served a residency at the Vanderbilt University Hospital, where he was on the visiting staff, associated with St Thomas and Baptist hospitals, associate professor of clinical medicine at his alma mater, specialist certified by the American Board of Surgery, member of the Southeastern Surgical Congress, fellow of the American College of Surgeons, lieutenant (jg), medical corps, U S Naval Reserve, died Aug 1, aged 37

Coen, Robert Archibald Ⓜ Portland, Ore , University of Oregon Medical School, Portland, 1938, interned at the Touro Infirmary in New Orleans and the Tri-State Hospital in Shreveport, La , formerly resident at the Hastings State Hospital in Ingleside, Neb , specialist certified by the American Board of Psychiatry and Neurology, fellow of the American Psychiatric Association, veteran of World War II, died Aug 29, aged 46, as the result of an automobile accident

Culmer, Walter Norman Ⓜ Indianapolis, University of Louisville (Ky) Medical Department, 1900, specialist certified by the American Board of Otolaryngology, fellow of the American College of Surgeons, died Aug 30, aged 84, of coronary occlusion

Denney, Walter Daniel, Winchester, Tenn , Meharry Medical College, Nashville, 1936, on the staff of the Coffee County General Hospital in Manchester, died in the Hubbard Hospital, Nashville, Aug 23, aged 60, of cerebral thrombosis

Dewey, George Willard, Virginia, Minn , Milwaukee Medical College, 1896, veteran of World War I, formerly associated with the Indiana State Soldiers' Home Hospital in Lafayette, Ind , died in the Virginia Municipal Hospital Aug 26, aged 89, of cerebral vascular accident

DuPuy, Alton Jackson Ⓜ Athens, Ala , Baylor University College of Medicine, Dallas, 1927, associated with the Athens Limestone Hospital, where he died Aug 23, aged 58, of myocardial infarction

Fankboner, Audley V Warren, Ohio, Medical College of Indiana, Indianapolis, 1898, died in the Marion General Hospital Aug 6, aged 84, of acute myocardial infarction

Foutz, Charles Ryle, Westminster, Md , University of Maryland School of Medicine, Baltimore, 1897, president of the Westminster Hardware Company and a member of the boards of Maryland General Hospital, Union National Bank, and the Mutual Fire Insurance Company of Carroll County, served as health officer for Carroll County, member of the American Academy of General Practice, died Aug 2, aged 87, of coronary thrombosis

Fox, Lee T Ⓜ Canton, Miss , Louisville (Ky) Medical College, 1891, past-secretary of the Mississippi State Medical Association, died Aug 29, aged 90, of bronchopneumonia

Fry, Clarence, Columbus, Ohio, Johns Hopkins University School of Medicine, Baltimore, 1921, on the staffs of the Mount Carmel Hospital and Grant Hospital, where he died Aug 19, aged 71, of cancer

Gavin, Stephen Edward, Fond du Lac, Wis , born in Neenah Aug 4, 1877, Rush Medical College, Chicago, 1899, fellow of the American College of Surgeons, member of the Aero Medical Association, past-president and served as chairman of the council of the State Medical Society of Wisconsin, which in 1944 presented him with the Council Award, past-president of the Fond du Lac County Medical Society, member of the House of Delegates of the American Medical Association from 1938 to 1956, veteran of World War I, past-president of the state board of health, received an honorary doctor of laws degree from Mount St Marys College Emmitsburg, Md , past-president of the school board, on the staff of St Agnes Hospital, where he died Aug 31, aged 83, of generalized arteriosclerosis

Goltman, Jack Sternberg, Memphis, Tenn , Cornell University Medical College, New York City, 1929, certified by the National Board of Medical Examiners, specialist certified by the American Board of Internal Medicine, member of the American College of Allergists, veteran of World War II, formerly instructor of medicine at the University of Tennessee College of Medicine, at one time on the staffs of the John Gaston and Baptist Memorial hospitals, died Aug 7, aged 58, of acute myocardial infarction

Gombar, Emil Frank Ⓜ Dickson City, Pa, Jefferson Medical College of Philadelphia, 1925, medical officer for the Dickson City School District for 20 years, received a presidential citation during World War II for service as a medical aide to the draft board in Dickson City, on the staffs of the State Hospital in Scranton and the Mid-Valley Hospital in Peckville, where he died Aug 28, aged 60, of massive gastric hemorrhage

Gray, Watson Womack Ⓜ Baltimore, Johns Hopkins University School of Medicine, Baltimore, 1919, member of the staffs of the Hospital for the Women of Maryland, Johns Hopkins Hospital, and the Union Memorial Hospital, died Aug 29, aged 67, of cerebral thrombosis

Greene, David, New York City, Columbia University College of Physicians and Surgeons, New York City, 1921, specialist certified by the American Board of Pediatrics, served as associate clinical professor of pediatrics at the New York Medical College, Flower and Fifth Avenue Hospitals, associated with the Sydenham and Morrisania City hospitals, died Sept 1, aged 67, of cerebral arteriosclerosis

Harvey, Homer Alvan, Canandaigua, N Y, Syracuse University College of Medicine, 1916, until his retirement in 1954 he was on the staff of the Genesee Memorial Hospital in Batavia, where he practiced for many years, died Aug 20, aged 76, of cancer of the liver

Lovell, Alfred Robert Ⓜ Bethlehem, Pa, Hahnemann Medical College and Hospital of Philadelphia, 1954, member of the American Academy of General Practice, on the staff of St Luke's Hospital, died Aug 28, aged 36, of myocardial infarction

Lundegaard, Ellert Emanuel Ⓜ Camarillo, Calif, Northwestern University Medical School, Chicago, 1930, served as health officer of Colfax, died in the Cottage Hospital, Santa Barbara, July 14, aged 64, of encephalomalacia due to occlusion of the left carotid artery

Megna, Salvatore Ⓜ Tucson, Ariz, Jefferson Medical College of Philadelphia, 1922, for many years practiced in Milwaukee, where he served on the staff of Mount Sinai Hospital, died Aug 23, aged 62, of coronary insufficiency

Montgomery, John Solomon, Milan, Mo, Rush Medical College, Chicago, 1903, served as county coroner, died in Kansas City, Aug 18, aged 83, of cerebral arteriosclerosis

Nowlin, Wilfred Jonathan Ⓜ Farmer City, Ill, University of Illinois College of Medicine, Chicago, 1927, member of the American Academy of General Practice, a member of the board of education of Farmer City, associated with the St Joseph's Hospital and the Mennonite Hospital, Bloomington, where he died Aug 11, aged 57, of coronary heart disease

Parr, John Ⓜ Methuen, Mass, Tufts College Medical School, Boston, 1903, bacteriologist on the Methuen Board of Health for many years, on the staff of the Lawrence (Mass) General Hospital, died Aug 23, aged 85, of arteriosclerotic heart disease

Pillsbury, Boyden Harlin Ⓜ Lowell, Mass, Harvard Medical School, Boston, 1899, served on the staffs of Lowell General and St Joseph's hospitals, died Aug 9, aged 86, of cerebrovascular accident

Pinkham, Edward Warwick, Sarasota, Fla, Harvard Medical School, Boston, 1896, fellow of the American College of Surgeons, veteran of the Spanish-American War and received two Silver Stars for gallantry in action in the Philippines, veteran of World War I, attending physician at the Metropolitan Opera from 1925 to 1934, for many years practiced in New York City, died Aug 30, aged 90, of arteriosclerotic heart disease

Potts, Enos Aitken Ⓜ La Puente, Calif, College of Medical Evangelists, Loma Linda and Los Angeles, 1922, member of the American Academy of General Practice, certified by the National Board of Medical Examiners, veteran of World War I, on the staffs of the Inter-Community Hospital, Covina, and the Hartland Hospital, died Aug 9, aged 69, of cerebral vascular accident

Powell, Fred C, Alamo, Texas, University of Kansas School of Medicine, Kansas City, Kan, 1911, died July 22, aged 84, of heart failure

Reed, Everett Hobart, Detroit, Mich, McGill University Faculty of Medicine, Montreal, Que, Canada, 1910, served in the Canadian Army during World War I, died in the Harper Hospital June 26, aged 80, of bronchopneumonia

Riley, Victor John Ⓜ Buffalo, Georgetown University School of Medicine, Washington, D C, 1925, for many years associated with the Lafayette General Hospital, where he was president of the board and past-president of the staff, died Aug 23, aged 58, of acute coronary occlusion

Rinaldi, John Paul Ⓜ Schenectady, N Y, Albany (N Y) Medical College, 1931, associated with Ellis and St Clare's hospitals, at one time a board member of the New York State Alcoholic Beverage Control Board, died Aug 18, aged 57, of acute coronary thrombosis

FOREIGN LETTERS

BRAZIL

Blastomycosis —Machado and Miranda (*Hospital*, July, 1960) studied a series of 306 patients with Brazilian blastomycosis The more common primary locations of the infection were the oral cavity, lungs, larynx, and skin Other organs were seldom initially affected The lungs and superficial lymph nodes, oral cavity, skin, and larynx were frequently the site of secondary spread of the disease In their series, the mucous membranes were the commonest path by which the parasite gained entrance to the body This may explain why the oral cavity was so often the site of primary lesions Lungs with their rich vascular system were especially susceptible to secondary involvement

There was a variety of initial symptoms, depending on the primary site of the infection Lesions in the oral cavity caused local pain or a burning sensation, those in the lungs stimulated coughing, those in the larynx produced dysphonia, and those in the intestines caused diarrhea and abdominal cramps When the infection started with a visceral involvement, the symptoms were intense, in contrast to the frequently symptomless primary skin lesions

GERMANY

Chloroquine for Asthma —H Kramer (*Med Welt* no 9, p 480, 1960) stated that many patients complaining of bronchial asthma have a chronic spastic bronchitis, chronic pulmonary emphysema with bronchitis, and bronchiectasis Their condition is, therefore, not one of classic bronchial asthma Treatment is often difficult

The author treated 21 such patients with chloroquine phosphate In 20 no clear-cut evidence of an allergic disease was obtained The therapeutic trial included only patients who were refractory to other treatments, 14 patients became completely symptom-free, and the other 7 markedly improved Only 2 complained of gastrointestinal symptoms from the drug and their treatment was discontinued, although their asthmatic symptoms were already greatly improved The previously begun theophylline medication was continued in all cases

The evaluation of a drug in the treatment of asthma is always difficult These patients usually have a labile psyche and are likely to be subjectively influenced To prevent this, the patients were told that the tablets would have no effect on the frequency of their attacks and that a result could not be expected to occur earlier than after three months of treatment After 8 to 14 days, subjective and objective improvement was observed in all patients

Nitroglycerin Abuse —F Weidlich (*Med Welt* no 9, p 494, 1960) stated that every painful disease implies the danger of drug abuse which, according to personality, can proceed to addiction Patients with angina pectoris take drugs not only to relieve the attacks of pain but also to relieve the fear of new attacks A report by Delius referred to addiction to nitroglycerin in three patients

The present author adds the report of a 46-year-old man who had had attacks of cardiac and gastric pain for many years The examination failed to reveal pathological findings The patient's father had suffered from angina pectoris for 12 years and died from apoplexy When the patient was examined in 1948, a diagnosis of myocardial damage was made From then on he took nitroglycerin preparations several times daily to allay fear In 1956 his daily drug requirements amounted to about 55 drops of nitroglycerin, 20 nitroglycerin tablets, in addition to methadone, vitamins, tranquilizers, laxatives, and hypnotics

An examination in 1958 again revealed no pathological condition of the heart The question as to whether the patient s complaints were organic or functional in nature cannot be definitely answered No doubt, he was a neurotic personality who overestimated the seriousness of his condition In an attempt to withdraw the nitroglycerin, the patient was given a placebo, the dose of which was gradually reduced No symptoms were observed during the withdrawal period It therefore appears justified to consider this a case of drug abuse rather than addiction The case history also tends to disprove the development of nitroglycerin addiction generally

INDIA

Control of Venereal Diseases —The Union Ministry of Health sanctioned the establishment of four venereal disease clinics Studies showed that in large cities and industrial areas 5 to 7 per cent of the population had syphilis A review of clinic admissions in Madras, Bombay, and Calcutta hospitals reveals that 60 to 75 per cent of the patients have early infectious syphilis Studies among pregnant women in large cities show that 5 to 12 per cent have positive serologic tests for syphilis In a survey of 1,000 pregnancies in 260 women with untreated syphilis, the results as related to the infant were (1) healthy non-syphilitic children, 30 per cent, (2) syphilitic babies, 40 per cent, and (3) stillbirths and neonatal deaths, 30 per cent

In 1949 the government, in collaboration with the World Health Organization, set up a Venereal Disease Demonstration Center in Himachal Pradesh Recent reports showed a great reduction in the incidence of syphilis in this state The center is engaged in training technical personnel, making surveys, and treating patients A scheme for the control of venereal and allied diseases was included in the second Five Year Plan which envisaged the establishment of venereal disease clinics in headquarters of the states and in district headquarters On an average about 675 patients report to each of these clinics every month for treatment

Training arrangements have been made for refresher courses at the Venereal Disease Training Center, Safdarjang Hospital, New Delhi, and Government General Hospital, Madras Intensive control schemes which include field survey and mass treatment have been conducted in Himachal Pradesh A short intensive venereal disease control program based on treatment of the total population of 130,000 in an area of 1,934 sq mi was launched in September, 1959, in a part of Punjab, and about 77,413 persons were treated during this campaign Facilities for the diagnosis and treatment of venereal diseases are also available for seamen at various ports

Culdocentesis—Purandare and Bhatt (*Mediscope* 3 117 [June] 1960) drew attention to the importance of culdocentesis in the early detection of true cases of ectopic pregnancy They have found it a safe, simple, and quick method and quite effective especially for deciding the line of treatment in early and doubtful cases of ectopic pregnancy They started using this method on every patient suspected of having an ectopic pregnancy

A series of 56 patients with acute abdominal conditions of gynecological origin were subjected to culdocentesis Most of these had had a short period of amenorrhea followed by irregular bleeding, slight pallor, pain in the lower part of the abdomen, tenderness in the fornices, pulse rate between 90 and 100, and systolic blood pressure between 90 and 100 mm Hg Each patient was prepared for both vaginal and abdominal operation The puncture is done with the patient in the lithotomy position A dry tap was obtained in 15 patients, unclotted blood in 25, clotted blood in 4, pus in 6, and straw-colored fluid in 6

The authors found that abdominal tuberculosis is often difficult to differentiate from ectopic pregnancy No complications were met as a result of this investigation The rectum was not injured in any case Culdocentesis is an important diagnostic procedure but should be used only in an institution where laparotomy can be performed if necessary

Of the 15 patients with dry tap, only 2 were found to have an ectopic pregnancy, and 13 exploratory laparotomies were thus avoided through the use of this procedure This method is preferable to watchful expectancy when the diagnosis is in doubt

Cardioarteriopathy and Diabetes—Sinha and Ghosh (*J A Phys India* 8 297 [July] 1960) stated that cardiovascular disease accounts for about 77 per cent of all deaths in diabetic patients They studied 20 subjects by paper electrophoresis of serum lipids and serum proteins Of these, five were diabetics, five were normal, five were diabetics with atherosclerosis, and five were non-diabetic with atherosclerosis

The biochemical changes were essentially the same in those with non-diabetic and diabetic atherosclerosis Patients with well-controlled diabetes with no vascular changes showed similar biochemical findings with an increase in beta-globulins and an altered lipid metabolism When vascular changes supervened, only a quantitative alteration occurred as alpha-2- and beta-globulin levels increased The total cholesterol and lipid levels showed a much higher level, but there was no qualitative difference The figures for patients with uncomplicated diabetes and for diabetics with vascular changes indicated that this quantitative increase in beta-lipoprotein and total lipid levels and elevation of the beta-globulin level played an important role in the pathogenesis of vascular lesions

The authors concluded that, compared to normal and non-diabetic controls, diabetics showed an increase in alpha-2- and beta-globulin levels, a decrease in albumin, an increase in cholesterol and total lipids, and a marked increase in beta-lipoproteins The hyperlipemia was probably responsible for the high incidence of coronary atherosclerosis among diabetics, along with the marked increase in beta-lipoproteins inhibiting fibrinolysis In addition, the presence of hypertension and duration of diabetes were found to be important The average duration of diabetes in this series among diabetics with coronary atherosclerosis was 10 to 15 years

UNITED KINGDOM

New Penicillin—Seven of the principal articles in the *British Medical Journal* of Sept 3 deal with a new penicillin, sodium 6 (2,6(dimethoxybenzamido) penicillinate monohydrate (Celbenin) Early in 1959, Beecham Research Laboratories announced that the penicillin nucleus 6 aminopenicillinic acid had been produced by fermentation

The availability of this substance made it possible to add a great variety of side chains other than those characterizing penicillins G and V, the only two penicillins which possess outstanding therapeutic properties of a number of penicillins already known This modification of the penicillin molecule is completely resistant to staphylococcal penicillinase and has great antibiotic activity and low toxicity Substantial concentrations of this new synthetic penicillin have to be maintained in the blood, and, since it is absorbed and excreted at apparently the same rate as penicillin G comparatively large doses must be injected at frequent intervals—1 Gm every 4 hours This is equivalent to 10,000,000 units of penicillin G daily

Douthwaite and Trafford treated 13 patients severely infected with staphylococci which were resistant to other antibiotics In every case the infection was eliminated Steward and co-workers treated 17 cases of staphylococcal infection in children with 100 mg of this new synthetic penicillin per kilogram of body weight, given daily at six-hour intervals The elimination of the staphylococcus from the lesion, though not always from carrier sites was also constant in this series These authors also treated 12 children who had hemolytic streptococcal infections and had successful results in all but one They concluded that this new synthetic penicillin is less active than penicillin G or V against streptococci, though with only about a 20-fold difference Nevertheless, this fact and the possibility of giving older forms of penicillin without frequent injections, seem to contraindicate the use of this new synthetic penicillin for this kind of infection, particularly in children

Shortage of Doctors—More medical students are needed to avert a crisis in the supply of doctors in about 1965, according to Lafitte and Squire (*Lancet*, Sept 3, 1960) They challenge the findings of the 1957 Willink Committee which stated that recruitment should be cut Lafitte and Squire say the number of students should be increased from the present 12,000 to 15,000 or more, and a fresh inquiry should be instituted to determine the number of doctors likely to be required in the next decade in all branches of the profession

The Willink Committee estimated a 4 5 per cent increase in population over 16 years, but trends since 1955 have pointed to an 8 per cent increase by 1970 Moreover, fewer doctors remain in active practice after reaching 65 The committee's suggested 10 per cent cut has thus been proved inadequate The authors also question the committee s belief that the number of British doctors going to other countries between 1957 and 1967 would fall substantially

The needs of underdeveloped territories are such that there is a powerful case both for enlarging British medical schools to take in more Commonwealth undergraduates and postgraduates, and for maintaining or increasing exports of British teachers and practitioners It is doubtful that the desired number of students could be accommodated without founding one or two new medical schools in provincial universities

Gnashing Cause of Headaches—Some chronic headaches without apparent cause have been found to be due to bruxism or habitual, unconscious clenching or grinding of the teeth This gradually results in permanent overstrain of the masticatory muscles

Berlin and Dessner reported that the patient may be unaware of his bad habit and may deny its existence It is commonplace during sleep but may be noticed during the day when the patient is concentrating on some trying work, particularly when he is upset or irritated Bruxism is commonest in people who are under emotional tension The treatment is to make it impossible for the patient to clench his teeth This is done by use of a relaxation" plate worn on the upper jaw Of 62 patients treated in this manner, success was achieved in 54

Genetics and Chromosomes—According to the Annual Report of the Medical Research Council for 1958-1959, accumulation of data on human genetics is hindered by such factors as the long interval between generations, the need to rely on observation rather than experiment, and the difficulty of distinguishing between hereditary and environmental influences Nevertheless, methods for the measurement of mutation rates have been devised for man, and estimates of spontaneous mutation rates are now available for about 15 harmful, but uncommon, dominant and for 3 sex-linked recessive traits Similarly, the relative importance of environmental and genetic factors in the production of congenital malformations is being gradually elucidated

A familial predisposition to certain malformations is associated with consanguinity, intrauterine environment, hydramnios, twin pregnancies, and seasonal, geographical, and social trends The value of a knowledge of specific characteristics of large human populations is illustrated by the discovery of an association between blood groups and certain diseases Three such associations that have been definitely established are (1) group A and cancer of the stomach, (2) group O and non-secretors of ABO antigens with duodenal ulcer, and (3) group

A with pernicious anemia It is possible that rheumatic fever, diabetes mellitus, and thyroid disorders may be correlated, respectively, with nonsecretors, group A, and ability to taste phenylthiocarbamide

Two of the most spectacular advances in genetics have been the discovery of the chromatin body in the tissue cells of females and the development of techniques for studying chromosomes in marrow cells, skin, and leukocytes The presence of sex chromatin indicates a female sex-chromosome constitution (XX), and its absence indicates a male sex-chromosome constitution (XY), except in certain developmental abnormalities where the sex phenotype is at variance with the sex chromatin, namely Klinefelter's and Turner's syndromes and testicular feminization

Chromosome counts have now established that the normal number in man is 46 and not 48 as previously supposed, this is made up of 22 pairs of autosomes and a pair of sex chromosomes Autosomal abnormalities have been found in mongols, who have an extra chromosome indistinguishable from a member of one of the smallest pairs, they are thus said to be trisomic for this particular autosome A number of other isolated examples have been found in patients with multiple congenital defects Abnormalities in the sex chromosome occur in patients with Klinefelter's syndrome, where the total is 47 and the sex chromosome XXY, and in patients with Turner's syndrome who have 45 chromosomes and a constitution XO A "super female" with 47 chromosomes and sex chromosomes XXX has been described Other interesting phenomena are being uncovered, including "mosaics" in which marrow cells contain two different complements of chromosomes and abnormalities in some patients with leukemia

National Health Service—In the House of Commons, the Minister of Health commented on the National Health Service which includes 2,641 hospitals with over 7,000 consultants and 12,000 other physicians in them, 194,000 nurses, 12,000 midwives, and 233,000 other employees, with a revenue account of more than a billion dollars a year Generally speaking, hospital building has reflected a pattern of disease and treatment which is not the pattern of today To give the best service, old hospitals should be modernized and new ones built

The waiting-list of 476,000 imposed two clear duties to operate a fair system of admission, and to improve methods and expand accommodation Last year there were four million courses of inpatient treatment, a 3 per cent increase over 1958 Solid progress is being maintained in the better use of outpatient resources In the last four years the number of visits to outpatient clinics increased from 37,000,000 to 41,250,000, this increase reflects the shift of emphasis from institutional care to care within the community

Future of Chest Services—The Minister of Health has called the attention of hospital authorities to a report on the future of the chest services by the Standing Tuberculosis Advisory Committee The main recommendations are that (1) the chest physician should be a member of the staff of a general hospital, (2) the management of tuberculous patients should remain a primary duty of the chest specialist, (3) the chest physician should work closely with the health officer on the epidemiological and preventive aspects of tuberculosis, and with the general practitioner, social worker, and health visitor, (4) appointments in chest diseases, including appointments of residents, should be to the staffs of general hospitals, and the chest clinic should be integrated into the outpatient department of such hospitals, and (5) provision should be made for a chest unit in the planning of new outpatient departments In new hospitals, beds should be available for diseases of the chest, some of them should be set aside for patients with tuberculosis Similar provision should be made in existing general hospitals where possible, otherwise existing suitable sanatoriums and chest hospitals could be used as chest departments of nearby hospitals or run in close association with them

Medical Treatment of Foreigners—In the House of Commons Dr Alan Glyn asked how many foreigners belonging to countries with which this country had no reciprocal arrangements had received free treatment under the Health Service in the last year, and what was the estimated saving, including any administrative costs, that would accrue to the exchequer if they were refused free medical treatment Mr Walker-Smith replied that information about numbers was not available With regard to the probable cost of any scheme for identifying foreigners, he doubted if any net saving would accrue

Dr Glyn, advocating the extension of reciprocal arrangements with other countries, suggested that one of the best ways of achieving it would be to stop free treatment to nationals of countries who did not have reciprocal arrangements Mr Walker-Smith would not accept this as the best method of obtaining reciprocity He said it was better to proceed on a basis of good will The cost was relatively small Efforts were made to check abuses, but in the second half of the twentieth century it was desirable not to fall below the standard of medieval monasteries whose members asked the sick traveller not whence he came or whither he went but sought to help and heal him

CORRESPONDENCE

HYDRALAZINE POISONING

To the Editor —The paper entitled Hydralazine Poisoning' by Bendersky and Ramirez in The Journal, Aug 20, page 1789, is written as if there were no question that hydralazine produced the fatal syndrome There is room, however, for a slight suspicion that hydralazine may not have been the etiological factor In the first place, the patient received only 100 mg per day, which is well below the dosage levels at which the lupus-like syndrome usually appears In fact, as the authors point out, Dustan and associates continued to treat their patients who developed "hydralazine poisoning" on reduced dosages of 150 to 300 mg per day with no disastrous results except recurrent mild arthralgia In my personal experience with several hundred patients treated with hydralazine in dosages of 200 mg or less daily for periods of one to nine years, no serious toxic reactions have appeared The authors also point out correctly that Dammin and associates did not find the classic wire-looping of renal glomeruli when autopsy was performed on their patient with hydralazine poisoning Wire-looping was found in the present case

In this report the possibility cannot be ruled out that the patient was suffering from spontaneously occurring disseminated lupus erythematosis and that the hydralazine was coincidental Perhaps a more precise title for their paper would have been Fatal Disseminated Lupus Possibly Due to Small Doses of Hydralazine—Report of One Case'

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PAUL EMILE BOTTA—ASSYRIOLOGIST, PHYSICIAN

To the Editor —As Thomas Young, M D, was the father of Egyptology, so, too, was Paul Botta, M D, a father of Assyriology The noted archeologist Sir Henry Layard wrote of Botta, 'To him is due the honor of having found the first Assyrian monument'

Son of the Italian historian Carlo Botta, Paul was born in Turin in 1802 and died in 1870 He studied under Cruveilhier, Orfila, Andral, and Dupuytren at the Faculty of Medicine at Paris, taking his doctorate in 1830 with a thesis, 'On the Use of Smoking Opium' As a surgeon he embarked in 1826 on the brig "Heros' for a three-year trip around the world, collecting scientific material wherever he went Later he served as military physician to the Khedive, Mehemet Ali, of Egypt and assisted in operations on the Arabic peninsula and Sennar Here he obtained a large zoological collection, which he brought to Cairo This experience afforded him an unusual opportunity to learn the languages and customs of the Near East At various times, he served the French government as consul to Alexandria, Mosul, Tripoli, and Jerusalem In 1840 the Oriental scholar Jules Mohl encouraged him to study the mounds just outside the town of Mosul, Iraq, called Koujunjik This was the site of ancient Nineveh, one and one-eighth miles in circumference and 40 to 90 ft high In December, 1842, Botta found some significant archeological materials in these ruins While so engaged, a man brought two large bricks bearing cuneiform writing from Khorsabad, 12 miles east of Mosul Botta immediately transferred his operations here Harassed by cholera, a hostile citizenry, and an unfriendly pasha, he succeeded in unearthing the grounds and the palace of Sargon II, King of Assyria (721 to 705 B C) The royal palace was built on a terrace 45 ft high, adorned with a temple, tower, sculptured pieces, corridors, and chambers bearing bas-reliefs of battles and every-day scenes Its rooms contained urns, statuary, altars, and winged bulls, all in excellent state of preservation, which now adorn the halls of the Louvre He did much of this work at his own expense Botta's five-volume work, 'Monuments of Nineveh" (Paris, 1849), paved the way for such distinguished archeologists as Layard, Rassam, Rawlinson, Hincks, and, more recently, Campbell and King Is it a wonder that one of the first written works of man was the medical treatise, the Edwin Smith Surgical Papyrus? Is it a wonder, too, that the first field of Assyriology was opened up by a physician?

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MAN MUST HAVE DEVELOPED IN RADIO-ACTIVITY HE HAS SO MUCH LEAD IN HIS PANTS!

To the Editor —Many years ago, when medicine was the art of healing, novitiates were taught that there were three kinds of healing healing by first intention, the ideal process but sufficient only up to a point, healing by second intention, usually accompanied by laudable pus, and healing by third intention, which leaves an ugly scar

Today we seem to be taught, per Madison Avenue, to build a public image with three kinds of lying lying of the first intention, over-simplification by the educator (a necessary part of teaching, but sufficient only up to a point), lying of the second intention, misinterpretation through ignorance (ignorance is laudable in science as long as an attempt is made to remedy this), and lying of the third intention, the intent to deceive (which leaves an ugly scar)

The current public radiation hysteria, history's third such period and now a political football, is an ugly scar on the body of science

Animals can be killed in seconds by large amounts of radiation, but this does not make *radiation* dangerous—it makes *large amounts of radiation* dangerous The over-simplification of saying that radiation is dangerous might be necessary in the teaching of students, but we in medicine are big boys now Radiation history is 65 years old We are beyond the point of lying of the first intention

All creation, including the human body, was born and grew up in a continuous bath of radiation We have known this for over half a century and have measured it with precision for over half a decade There is still plenty of laudable pus mixed with the understandable misunderstandings of deficient knowledge But in regard to radiation we are now beyond the necessity for lying of the second intention

Now we come to the problem of lying of the third intention

One of the minor latter-day results of the study of radiation has been the development of nuclear weapons Weapons are used in war, war is bad, therefore, nuclear weapons are bad Maybe this is logical thinking, and a legitimate attitude for a physician to adopt But when the word "weapons' is dropped and the conclusion becomes "everything radioactive is bad," this is not logical

The National Research Council has just published a second report to the public on the dangers of radiation This second report shows a 179-degree change in position from that taken in the first report to the public But the science of radiation has not taken a 179-degree reversal Since only the public image has been reversed, one wonders whether there ever was a scientific problem, or was this public image just a gimmick used to obtain public funds?

Our fathers were also interested in the dangers of radiation They invented the term "Safe Dose" because obviously there was such a thing as too large a dose But as students we confused the word "safe" with the word "unsafe," so the term was changed to "Tolerance Dose" But the word "tolerance" was confused with the word "intolerable," so the term was changed again to 'Maximum Permissible Dose"

In the very laudable Atomic Energy Act of 1954 the words " unreasonable risk to the common defense and security and to the health and safety of the public" were used Unfortunately, this added a legal flavor to the term "Maximum Permissible Dose," and "permissible" changed from a medical restraint to a legal restriction Recently the Federal Radiation Council, realizing that the propaganda on the dangers of radiation had gone too far and was being misused to redirect public monies, changed the term for the fourth time It is now the 'Radiation Protection Guide," which was what our scientific fathers meant in the first place, and everybody, including the propagandist, realizes this

But there *is* a medical problem Today we can make nuclear electric power, but enormous amounts of radiation are an adjunct This electric power is used by people, so it is convenient to have the power production plant close to people The reactors that make power are as near 100% safe as is possible, but even at the height of engineering protection there will still be accidents

Industrial plants are using more and more radiation because it is safe, easy to control, and has caused few accidents But we are human and make mistakes, and, until we achieve a state of perfection, we can continue to expect accidents With the ever-growing industrial use of radiation, these accidents will get bigger and more frequent The real medical problem is not the control of radiation, this we already do to the best of our ability The real medical problem is how to take care of the radiation accident once it has occurred

Fortunately, the medical profession also uses radiation Fortunately, the basic knowledge necessary in medical use is identical with the knowledge necessary in caring for overexposed patients

A science service news report from Washington on June 23, 1960, stated that the Atomic Energy Commission, organized labor, and medical experts are squaring off on the issue of nuclear dangers to the public This article states that the AFL-CIO has taken the position that the AEC tends to "minimize' the dangers and thus weaken efforts to prevent accidents This is not true If anything, the AEC has maximized dangers, sometimes to the detriment of progress in research The position has been taken that radiation causes sterility At some levels radiation does cause sterility, but it is also used to promote fertility Evidence points to a temporary sterility and this only at certain levels of radiation The position has been taken that radiation causes sexual impotence This is probably untrue The position has been taken that radiation causes a general physical deterioration This is undoubtedly true at some levels of radiation, but probably untrue at other levels It might also be true to say that a lack of radiation causes sterility, sexual impotence, and general physical deterioration Evidence, albeit indirect, is piling up to show that small amounts of radiation might be beneficial

The AFL-CIO misses the point The use of radiation is increasing the necessity for skilled labor Almost all the developments in the field of radiation are for the benefit of the working man, only an infinitesimal fraction has been developed for his destruction Anyone who has followed the program of the United States Atomic Energy Commission realizes that even bomb blasts are being planned for peaceful uses But within the scope of radiation there will be accidents, and these must be treated by physicians Therefore physicians must be trained to understand and to use radiation, they must be trained to treat radiation casualties

This training of physicians in the use of radiation has been discouraged There has been an abrogation of the responsibility of Congress for the " health and safety of the public This abrogation of responsibility has shown itself not in a failure to appropriate necessary funds but in the lack of interest in seeing how these funds have been spent, in the lack of understanding of the real medical problem—accidents, in a failure to understand the nature of medical research

It is an abrogation of responsibility to save the mouse population from extinction caused by lipstick

It is an abrogation of responsibility to let any government agency set up a Cure of the Month club

It is an abrogation of responsibility to allow the Public Health Service to be 65 years behind the times in the field of radiation

It is an abrogation of responsibility to fight windmills and background radiation

It is an abrogation of responsibility not to balance risks with benefits, safety is a relative thing

The only 100% safe position to take regarding radiation (or anything else in life) is "Don't be born!" It is a time-tried and scientifically-tested fact that every person born dies But it is also true that some people die sooner than others Some of these earlier deaths might be preventable, some deaths and some diseases might be unnecessary

This is how medicine lives—by healing the sick It would be more idealistic to prevent the preventable, and still more idealistic to be prepared for the inevitable

Some radiation exposure is inevitable But radiation *per se* is not dangerous People are more dangerous than anything

MARSHALL BRUCER, M D
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UNDESCENDED TESTES

To the Editor —The author of the answer to the question on undescended testes in THE JOURNAL, June 11, page 742 states, " since only 12% of testicular tumors occur in undescended testes, surgical exploration can be delayed until such time as more definite indications exist"

This I cannot understand I do not know the incidence of undescended testes, but I would guess it is but a fraction of 1% If tumor development in testes had nothing to do with testicular ectopy, then the incidence of ectopy should be the same in testes, tumorous and non-tumorous, i e, the incidence of ectopy in testes with tumors should also be only a fraction of 1% It is much higher in tumor-bearing testes, suggesting a causal connection between ectopy and malignant changes Thus, the statistical information in the expert's answer is a strong argument for removal of undescended testes, not against it

To wait for more 'definite indications" is dangerous Many an undescended testis is impalpable, high in the inguinal canal or even in the abdomen Once there are metastases, it is too late

HEINRICH LAMM, M D
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To the Editor —Undescended testes are treated surgically for four reasons first, to correct an anatomical abnormality which may be embarrassing to a growing child, second, to encourage the normal development of testes to produce sperm, third, to bring testicles into the scrotum so that possible tumor formation will be noted early, and, fourth, to correct associated congenital hernia The more that is learned about the physiology of the developing testis, the more it is realized that if orchidopexy is to be done it should be done at an early age, probably before the age of five It does appear that testes which remain in an abnormal position beyond this age usually fail to mature and are inadequate so far as spermatogenesis is concerned The trend at the present time, therefore, is early operation after an effort to cause descent of the testicles by giving a short full course of gonadotrophic hormone, usually 5,000 units over a period of two weeks There is some argument against its use but, in the main, it seems to me reasonable to try this because some testes do descend as a result of using gonadotrophic hormone This seems to be true even though one is dealing with a unilateral undescended testicle, although I believe the chance that descent will occur under such circumstances is quite slight In the presence of a unilateral undescended testicle, the problem of spermatogenesis does not play a large role if the other testis is normal, but even here I think early operation is indicated If the testis cannot be brought down or is tiny, it probably should be removed because of the increased incidence of tumors developing at a later age in testes which are either retained in an abnormal position or which are brought into the scrotum

If the operation is not done at this early age, I believe it should be performed when the patient is seen, preferably before or at puberty, and even in an older patient in the presence of hernia After the age of puberty, if a normal testis is present on the other side the abnormal testis should probably be removed The question of operation for bilateral undescended testis after the age of puberty, in the absence of troublesome hernia, is one which is settled usually at the discretion of the doctor or the patient I doubt that it will ever result in spermatogenesis, but I see no objection to its being done and it does have the advantage, if the descent of the testes can be accomplished, of leaving the testicles where they can be easily palpated

The incidence of the development of cancer in undescended testes has been the subject of much dispute, but I think the best way to look at the situation is to consider that about 15% of tumors of the testis occur in undescended testicles or in testicles which have been brought into the scrotum The only bright point relative to this is that most of these tumors are seminomas, which are, of course, radiosensitive and which are usually capable of being cured unless wide-spread metastases have occurred Another point which has impressed me recently is the fact that a second operation to produce normal position of a testicle in the scrotum is quite feasible There is no doubt but that it is frequently possible to place the testicle in a better position at a second operation than was possible in the initial effort This must have to do with the growth of the spermatic cord, I have been considerably surprised on several occasions at how easy placement of the testicle in the scrotum was at a second operation, even though it was completely impossible at the first operation

A final comment is that it seems doubtful that orchidectomy performed as well as possible will often lead to a normal testis in the sense that it will produce normal numbers of motile sperm The more evidence accumulates in this regard, the less certain it becomes that orchidopexy by itself, even at an early age, leads to normal spermatogenesis It would appear that most of these undescended testes are in effect congenitally abnormal It should not, however, I believe, deter physicians from performing orchidopexy in the hope that spermatogenesis may occur or improve

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ANAPHYLACTIC REACTIONS TO CHYMOTRYPSIN INJECTIONS

To the Editor —Two clinical notes appeared recently in The Journal concerning anaphylactic reactions to aqueous chymotrypsin injections, one by Liebowitz and Ritter (Jan 9, p 159) and one by Rose (June 18, p 796)

The January note, which contained a statement that no similar instances could be found in the medical literature, elicited a letter, which also appeared in The Journal (March 19, p 1320), indicating that anaphylactic reactions to chymotrypsin without carrier had been recorded in a study in the *Proceedings of the Society of Experimental Biology and Medicine* (71 250 [June] 1949) In the June note mention was made of the fact that a survey of the literature revealed one previously recorded episode, which, however, was not related to either of the above-mentioned instances The report of this latter episode was made by MacLaren and Aladjem (*J Allergy* 28 89 [Jan] 1957)

This information is provided for the purpose of correlating data which otherwise might escape the attention of other investigators who might have occasion to search the literature on this subject within the near future

George X Trimble, M D
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To the Editor —Dr Kenneth D Rose reported in The Journal, June 18, page 796, an anaphylactic reaction to aqueous chymotrypsin injection in a patient not previously known to be sensitive He states, "A survey of the literature revealed a report on only one such sensitivity reaction" (MacLaren and Aladjem *J Allergy* 28 89 [Jan] 1957)

We would like to call attention to our article published in The Journal, Jan 9, on this very subject The title of the article is "Anaphylactic Reaction to Chymotrypsin " We have received communications from several other physicians throughout the United States who have seen similar reactions to aqueous chymotrypsin (Chymar)

Daniel Liebowitz, M D
Henry Ritter Jr , M D
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BOOK REVIEWS

Communicable and Infectious Diseases Diagnosis, Prevention, Treatment By Franklin H Top A B M D M P H Professor and Head, Department of Hygiene and Preventive Medicine, State University of Iowa, Iowa City and collaborators Fourth edition Cloth $20 Pp 812 with 137 illustrations C V Mosby Company, 3207 Washington Blvd, St Louis 3, Henry Kimpton, 134 Great Portland St, London W 1, England 1960

In the 19 years since the appearance of the first edition, Dr Top's book on the communicable and infectious diseases has made for itself a unique position of leadership Today it is probably the country's best recognized text on the clinical aspects of this important group of diseases This position has been earned through the author's extensive first-hand knowledge which finds expression in straightforward and lucid presentation of facts and opinions It is a 'middle of the road book, not given to radical and extreme ideas, yet constantly abreast of new developments and quick to incorporate that which is found to be valuable The fourth edition, which has recently appeared, maintains the character, quality, and high standards of its predecessors As in previous editions, Dr Top has enjoyed the collaboration of other authors, this time 20 in number, each chosen for his unquestioned familiarity with the condition about which he has been asked to write Over half of the 63 chapters are the work of Dr Top himself In spite of the number of collaborators and the inevitable differences of points of view inherent in such a situation, the book has a remarkable unity of style and approach that is often lacking in volumes to which so many experts have contributed The book is, thus, truly the expression of the author's experience and judgment, supported by the special knowledge of a group of his peers The present edition contains new chapters on enteroviruses, acute respiratory infections, and staphylococcal infections Nine other chapters have been completely rewritten by new authors, while extensive revisions have been made in many others In all chapters there has been a careful incorporation of new knowledge The book is thus thoroughly up-to date, subject only to the inevitable omission of significant new discoveries made too late for incorporation, yet known by the time the book reaches the hands of the reader

The author and publishers are to be commended on the outstanding improvement in format of the new edition The third edition, while of excellent quality of text, was of a size that made its use both cumbersome and difficult Use of a larger-sized page and some condensation of text have made it possible to achieve a one-third reduction in the number of pages, in spite of the incorporation of three new chapters and without reduction in size of type In its present form it is far more readable and useful

GAYLORD W ANDERSON, M D

Intra Osseous Venography By Robert A Schobinger M D, Clinical Instructor in Surgery, Albert Einstein College of Medicine, New York Foreword by Philip J Hodes, M D Cloth $14 50 Pp 243 with 317 illustrations Grune & Stratton, Inc, 381 Park Ave S, New York 16, 15/16 Queen St, Mayfair, London, W 1, England, 1960

The title of this book, while technically correct, is deceptive since this is not primarily a study of the venous system within the bone but a study of veins after a radiopaque medium is introduced into the bones Most of the book deals with extraosseous venous patterns The form of the volume is somewhat awkward since it is an atlas, and there is some doubt as to how sturdy it is

The author tries to establish by venography some normal anatomic patterns and also to interpret the manifold anatomic variations In an effort to do this, he has recorded some 1,200 injections into various bones, which he had personally given He does not state how many of these revealed normal and how many revealed pathological findings Fifteen types of injections were used, and, as some of these types were used in various sites, the actual number of injections in any one site available for statistical comparisons was reduced

The illustrations of what can be expected from various types of injections are numerous and well organized as to purpose, anatomy, position of the patient, techniques, and the clinical applications The clinical application of this procedure seems to be the weakest point in this atlas, as many of the uses are speculative and not illustrated by any specific examples The actual demonstration of lesions by this method, as portrayed in the atlas, is rather scanty, and no firm individual pattern is established for disease entities in most instances

The book represents a tremendous amount of work and thought and has an extensive bibliography which appears to be up-to-date The index seems adequate As a clinical tool, much more experience must be gained in determining the best type of procedure before it will replace some of the methods which are at present being used in pathological problems

W H BICKEL, M D

QUESTIONS AND ANSWERS

LABORATORY TESTS

To the Editor.—*A patient with a fever of undetermined origin had specimens of blood, urine, stool, sputum, and nasal secretion sent to a laboratory for bacteriological studies. How long should it take to get the results of such studies? When should antibiotic sensitivity tests be available? Should cultures be made for anaerobic organisms?*

M.D., Pennsylvania

Answer.—In some instances, tentative identification of causative microbes may be made immediately by examining stained slide preparations of the named specimens, if the organisms predominate or are present almost alone. Preliminary reports of cultures should be ready about 24 hours after planting them, but definitive identification and serum or phage grouping or typing take longer. Occasionally growth is delayed, but *staphylococci, streptococci, pneumococci, meningococci, Hemophilus influenzae, Salmonella,* and *Shigella* usually grow rapidly on appropriate mediums. *Pasteurella tularensis, Brucella,* and some yeasts and fungi require several days to a week or more; *Mycobacterium tuberculosis* also takes longer. Growth and selection of colonies must be accomplished before antibiotic sensitivity tests can be made, and this may take another 24 hours. Cultures for *anaerobes* are desirable to detect *Bacteroides, Clostridia, Actinomyces,* and others, and to serve as controls for the aerobic cultures. In fevers of unknown cause and of short duration viral studies may also be necessary, and these require a week or more.

Hobart A. Reimann, M.D.

NOCTURNAL MUSCULAR PAINS

To the Editor.—*What is the current concept of the cause of nocturnal muscular pains of young children with no evidence of rheumatic disease? Is there any effective therapy?*

Raymond E. Conover, M.D., Neptune, N.J.

Answer.—The condition usually referred to by the lay public as "growing pains" may have various causes, including "idiopathic." Frequently, the condition seems to be the result of muscle strain from minor orthopedic deformities such as flat feet or tight heel cords. The mechanical stresses that these deformities place on certain muscle groups which were not designed to perform certain functions are thought to cause a localized fatigue of, and perhaps damage to, individual muscle fibers. When such orthopedic conditions are present, relief of the nocturnal muscle pains is usually achieved with appropriate corrective shoes or exercises or both. Sometimes, sitting habitually in a particular way, such as tailor-fashion or with the legs folded under the buttocks, may add an ischemic factor to unphysiological muscle-stretching which can produce pain.

Isolated instances of pain may be due, undoubtedly, to such things as unrecognized trauma or unusual muscular exertion, or the pain may represent a prodromal symptom of a systemic febrile illness. Since the small child usually cannot differentiate muscle pain from pain originating in the bones or joints, the physician should be alerted to the possibility of intrinsic bone or joint lesions and be aware that the leukemic patient may have intermittent bone pain. Nocturnal muscular pains are not significantly associated with subclinical or active rheumatic fever, despite the fact that this symptom is frequently cited as a manifestation of rheumatic fever.

Robert H. Richie, M.D.

TOPICAL ANESTHESIA

To the Editor.—*Does the topical use of anesthetics predispose a patient to future sensitivity reactions? I am considering the rectal use of ethyl-aminobenzoate, dibucaine hydrochloride, or cyclomethycaine sulfate to minimize the trauma of rectal examinations during labor.*

Stuart L. Smith, M.D., San Francisco, Calif.

Answer.—Local anesthetics are among the group of drugs often causing hypersensitivity reactions. Sensitization to these compounds is produced more frequently with topical use than with parenteral administration. One factor in the development of sensitization is repeated application of the drug, as evidenced by the high incidence of sensitivity to procaine among dentists and physicians who have frequent contact with the drug. Furthermore, cross-sensitization to chemically related drugs, for example, those containing the p-aminobenzoic acid nucleus, has been reported; thus, hypersensitivity reactions occur most often with this group of anesthetics. Nevertheless, all topical anesthetics have a sensitizing potential, although slight for some compounds, which should be kept in mind, especially when the drug is used in the rectum or vagina.

John R. Lewis, Ph.D.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

PTYALISM

To the Editor —*Can ptyalism be caused by achlorhydria? If so, what is the physiology involved?*
John A Mangieri, M D, Bangall, N Y

Answer —Though achlorhydria is known to accompany varying disease states, definite evidence of its causal relationship is lacking Even more tenuous is the relationship between achlorhydria and the many symptoms ascribed to it by the older textbooks Experience with patients who have been achlorhydric for years provides good evidence that it does not of itself cause symptoms The salivary glands are known to secrete only in response to impulses transmitted by the autonomic nervous system Ptyalism should be considered an expression of increased autonomic activity and is seen in patients who are experiencing various tension states and who usually have other functional symptoms Being dependent on tension factors, ptyalism is almost invariably a temporary (but remittent) symptom Achlorhydria and ptyalism are unrelated

P W Brown Jr, M D

ELECTRO-DESICCATION OF THE SKIN

To the Editor —*In reviewing the literature on the use of the electro-desiccator, I found no mention of obtaining a biopsy specimen before desiccating or coagulating a lesion Is it ever justifiable to desiccate or coagulate lesions of the skin even though, clinically, one is 99 per cent sure the lesion is a benign lesion such as a verruca or benign nevus without first performing a biopsy? In other words, if one removes with the scalpel a benign lesion of the skin for microscopic examination, desiccation or coagulation would no longer be necessary*
Thomas J Kennedy, M D, Philadelphia, Pa

Answer —If you would reword your question to state that you were 100 per cent sure that the lesion was benign, it could be said that no biopsy would be required If the clinician is confident that he is dealing with a non-malignant growth, it is permissible to remove the lesion without biopsy material being made available, but if one is treating a pigmented nevus, one cannot be certain of the pathological definition of the involved tissue In this instance it is never justifiable to remove the lesion by means of electro-desiccation A specialist in this field may, however, be able in specific instances to select lesions that permit safe removal by this method Nevi should be surgically excised and the specimen referred to the laboratory for pathological examination This practice should be adhered to without exception

Jeff Davis, M D

HOSPITAL ARCHITECTURE

To the Editor —*What information can the anesthesiologist give the architect in regard to modernizing a hospital operating-room suite?*
M D, Illinois

Answer —The anesthesiologist should write to the American Hospital Association or the Association of Hospital Architects, asking them for information about specific sizes and equipment The type of hospital and type of patients are important factors to be considered

The following general facts should be remembered in remodeling an operating-room suite

1 Operating rooms should be made large enough to maintain aseptic technique and enable personnel to move about without brushing against each other or touching sterile drapes and equipment

2 In teaching hospitals, provisions should be made for additional floor space or some type of gallery for observation

3 Despite the theoretical adequacy of modern methods of artificial illumination, provision should be made for daylight where it is possible or feasible

4 Overheating should be avoided, and adequate mechanical ventilation should be provided Because of the risk of explosion, relative humidity should be between 55 and 60 per cent, and recirculation of air in the operating room should not be permitted Particular care should be taken in the placement of heat-producing equipment, such as lights, autoclaves, and sterilizers, in order that they do not nullify the objectives of the system

5 Floors should be impermeable and electrically conductive

6 The walls should be of a hard, durable, and washable material

7 A call system for summoning nurses and other staff members should be available

8 Operating rooms should be planned in pairs with scrub-up' and substerilizing facilities between them, if possible A modern operating room should have, if possible, recessed wall cupboards, ceiling-light units, an electric clock with a sweep second hand, an x-ray film viewer, piped oxygen, and suction apparatus

9 At least one operating room should be equipped with light-proof blinds

There are many specialty items which should be considered if there are special rooms for fracture or urological work Every modern hospital should have anesthesia rooms and a recovery room There must be ample space for preparation of supplies and for a retirement room with modern sanitary facilities for physicians, nurses, and hospital personnel

Kenneth B Babcock, M D

NEGATIVE EUGENICS

To the Editor.—*Please list for me those conditions which are hereditary and for which a sterilization procedure may be performed to prevent that disease's perpetuation.*

Jay R. Longley, M.D., Newport Beach, Calif.

Answer.—At one time many held the opinion that it should be possible to prevent the transmission, and therefore reduce the frequency, of unfavorable genes in the population. However, in addition to suffering from the well-known dangers of political misapplication, such a program of negative eugenics is not feasible either in theory or in practice.

In recessively transmitted abnormalities, such as phenylketonuria and galactosemia, it is rare to find an affected person who is actively fertile. This is due to decreased fertility, early death, or institutionalization of affected persons. Most cases are derived from outwardly normal carrier-parents. Even if the affected persons breed, they produce mostly normal children. Sterilization of the heterozygous carriers, while theoretically possible, would waste a tremendous potential of normal fertility. For example, if the incidence of a rare recessive disease is 1 in 10,000 of the population, the incidence of carriers would be 2 per cent of the population or about 3,500,000 persons in the United States alone. Since it is commonly believed on good theoretical evidence that everyone carries one or more potentially unfavorable recessive genes, such a program becomes absurd. It would be far more practical to be able to detect such carriers and discourage them from mating with one another, thereby reducing the number of homozygously affected persons.

Those severely affected by diseases transmitted by a rare dominant gene, such as Marfan's syndrome and myotonic dystrophy, are generally infertile. Other unfavorable dominant genes producing such diseases as retinoblastoma and neurofibromatosis not only produce low fertility but also have a high mutation rate. This high mutation rate tends to maintain the incidence of these diseases at a constant level despite the low fertility. For a sterilization program to be effective in some of these conditions, it would be necessary to find the affected parent before he produces affected offspring, which is difficult if the parent does not show full expressivity of the gene, and not necessary if he is severely affected. Once the parent has had affected offspring, it is too late for preventive sterilization. Also, the parent will more than likely refrain from further procreation.

If we deal with graded characters such as mental deficiency, the decision is even more difficult, since we do not know where to draw the line for or against sterilization. Severe mental defectives are usually relatively infertile in any case, and the greater-than-average fertility of the groups with somewhat reduced mental ability may be of advantage to the human species. These groups most likely carry genes in single dose which, when present in double dose, produce greater mental ability. Their offspring thus provide us with mentally normal and above-normal persons, thereby replenishing the offspring lost through the lesser fertility of mentally above-average persons.

In view of the above considerations most human geneticists believe that negative eugenics by sterilization is not only impractical but may be detrimental to the human species.

Kurt Hirschhorn, M.D.

PULMONARY CANDIDIASIS

To the Editor.—*A patient with a severe cough was found to have large numbers of* Candida albicans *in his sputum. A roentgenogram showed pulmonary infiltration. Repeated skin tests with PPL were negative. The patient has never lived in western or southern states. Should he be treated with aerosols, sodium caprylate, brilliant green, gentian violet, or gentian?*

Wilfred M. G. Jones, M.D.
Pago Pago, American Samoa

Answer.—The problem of establishing a diagnosis of pulmonary candidiasis is difficult. The significance of finding *C. albicans* in sputum is doubtful, since these organisms may represent normal flora of the mouth, throat, and skin. In a recent study by Baum (*New Engl. J. Med.* 263:70 [July 14] 1960) 55% of patients, 36% of hospital employees, and 20% of medical students had positive cultures of this organism in their sputum.

Diagnostic tests should include a Gram stain of sputum that has been washed with sterile isotonic sodium chloride solution to remove saliva, acid-fast stains, sputum culture for other bacteria and fungi, and blood cultures. Lung biopsy and culture may be helpful. Bronchoscopy with stains and cultures and search for malignant cells may also help. Lymphoma or Hodgkin's disease must be considered.

Treatment of patients who have pulmonary candidiasis with nystatin given orally has not been satisfactory, since absorption from the alimentary tract is poor. Intravenous therapy with nystatin may result in severe reaction. Intravenous injections of amphotericin B may be used if the diagnosis is well established and the culture is susceptible to the antibiotic. This drug produces reactions which require great care in its administration.

Aerosols, sodium caprylate, brilliant green, gentian violet, and gentian are of no value.

Robert I. Wise, M.D.

DRUG INDUCED IMPOTENCE

To the Editor:—*In the use of ganglion-blocking agents, which have been working well in reducing diastolic pressure, I have had many complaints from men between the ages of 45 and 55 years that, since taking such drugs, their sexual drive has been markedly lowered. I would appreciate your comments regarding this.*

Kenneth H. Le Fever, M.D., Kingston, N. Y.

Answer.—Drugs which interrupt autonomic reflexes frequently decrease potency. The following statement by Hoobler is found in the chapter on the Choice of Drugs in the Treatment of Hypertension in *Drugs of Choice, 1960-1961* (edited by Modell, St. Louis, C. V. Mosby Company, 1960): "With adequate blockade, impotence is to be expected in most male patients."

It is suggested that your patients may be confusing decreased potency with decreased libido.

Christian Wingard, M.D.

PERSISTENT EXOPHTHALMOS

To the Editor:—*I would appreciate information on the current opinion and feeling with regard to the surgical treatment of persistent exophthalmos after thyroid resection for toxic goiter. Two years ago, I operated on a woman for a diffuse toxic goiter, associated with severe exophthalmos. The toxic symptoms have been well controlled, and the patient is now in good balance. The exophthalmos improved somewhat after operation but worsened again during a subsequent pregnancy. Medical treatment directed toward the exophthalmos has consisted of steroid therapy and a small dose of thyroid extract. Both medications have since been discontinued, since they did not help. The patient has made an excellent adjustment to her cosmetic defect, but mechanical difficulties are now being experienced, in that she cannot close her eyes during sleep, which causes drying of the sclera and cornea. As yet, no corneal ulcers have developed. The patient is willing to have another operation if there is a reasonable chance of success. What treatment is recommended?*

Russell A. Salton, M.D., Williamson, W. Va.

Answer.—Surgical treatment of persistent exophthalmos is indicated in patients with severe exophthalmos complicated by persistent diplopia, corneal ulceration, excessive drying of the surface of the eye, threatened visual impairment due to corneal, fundal, or optic nerve lesions, or when appearance is sufficiently distressing to the patient. The operations are of two main types, namely, lateral tarsorrhaphy, or some form of decompression of the orbit. Orbital decompression is best accomplished by the transcranial approach popularized by Naffziger and Dandy, or by some form of lateral orbitotomy after the method of Kronlein and its more recent modification by Berke and Guyton.

The patient described might profit from a course of treatment with radioiodine (I^{131}) as discussed by Schultz (*Am. J. Ophth.* 50:26 [July] 1960). If there is no improvement, a lateral orbitotomy after the Kronlein-Berke technique should be considered. The following references are recommended.

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Theodore N. Zekman, M.D.

SEA WATER

To the Editor:—*It has been suggested that sea water concentrated to 0.1 its original volume and taken in daily doses of 4 cc. supplies trace minerals not found in the average person's daily diet. Is there any scientific evidence that sea water thus taken has any prophylactic or therapeutic value?*

G. L. Bauer, M.D., Belleville, Ill.

Answer.—The ingestion of sea water or sea-water concentrate as a source of minerals has been suggested by several groups, but there is no justification for the use of such products as dietary supplements. In fact, studies have shown that large amounts of sea water may cause toxic reactions. Sea water is much more concentrated than body fluids, having a sodium ionic concentration of 420 mEq. per liter and a chloride ionic concentration of 470 mEq. per liter. Blood-plasma levels of the same ions are 142 and 104 mEq., respectively. The ingestion of small amounts of sea water may increase the body's retention of water.

In experimental studies on man it has been impossible to demonstrate any beneficial effect or marked adverse effect from drinking unconcentrated sea water up to 250 ml., but studies in regard to survival of shipwrecked persons have indicated that the ingestion of larger amounts of sea water or continued ingestion of small amounts of sea water has always proved fatal.

Ogden C. Johnson, Ph.D.

DYSPAREUNIA

To THE EDITOR —*A 55-year-old woman had one normal pregnancy 30 years ago Her menopause has been normal For the past three or four years she had a severe labor-like pain during the orgasm She has no emotional or psychic problems and is otherwise in excellent health What is the cause and treatment of this condition?*

M D , New Jersey

ANSWER —Women have definite uterine contractions during orgasm These contractions have been recorded through biophysical measuring techniques There is great individual variation in intensity, duration, and frequency of recurrence of these orgasmic uterine contractions, just as there is great individual variation in intensity, duration, and frequency of recurrence of labor contractions It is presently considered that the uterine contractions associated with the orgasm are similar to, if not identical with, labor contractions from a physiological point of view The neurological influence on or control of these orgasmic uterine contractions remains as much a mystery as it does in labor contractions

We have recently encountered several patients with clinical complaints similar to those described above Their orgasmic uterine contractions have become painful in the 5-year to 10-year period immediately after the menopause At present, there is no established explanation for this postmenopausal timing of the complaint The answers to several questions would, however, be helpful in dealing with this problem Did the patient have particularly forceful labor contractions during the delivery of her one recorded normal pregnancy? If so, the present symptoms could well be due to a humoral influence on the uterine musculature This would be particularly true if there was still some evidence of continued physiologic estrogen production (some residual vaginal mucosal stimulation) or a history of estrogen replacement therapy

We know that estrogen-stimulated uterine musculature is particularly susceptible to the influence of the posterior pituitary, as demonstrated by the marked increase in contractile intensity This is obvious during labor, when the influence of progesterone is essentially eliminated and the estrogen-stimulated uterine musculature is available It is also of interest that the pituitary is particularly active in the production of gonadotropins during the 5 to 10 years of the immediate postmenopause

It would also be interesting to know whether the painful uterine orgasmic response also develops during a manipulative, as well as a coitally induced, orgasm If so, this information would lend more support to the suggested biophysical humoral response described above If the possibility of mechanical irritation of the cervix or stimulation of a retroverted corpus (so frequently complained of during coitus) were eliminated, we could be more certain of our ground

As to treatment, there is no certain cure Suggested treatment might include the obviation of direct estrogenic influence on uterine musculature by means of progesterone or (considering the patient's age) testosterone A small replacement dose of testosterone given orally (in combination with estrogen to obviate the masculinizing influence) might be beneficial This type of medicament is on the market in a 20 1 testosterone-estrogen ratio

W H MASTERS, M D

PNEUMOTHORAX AND TRUMPET PLAYING

To THE EDITOR —*A 20-year-old trumpet player has undergone two episodes of spontaneous pneumothorax Before advising that he give up his plans for this professional career, I would like to obtain any available information on the intrathoracic dynamics of playing the trumpet or allied instruments*

M D , Washington

ANSWER —Alterations in intrathoracic dynamics produced by the playing of a trumpet are the result of forced expirations through a restricted orifice While I am unaware of any studies in which intraesophageal or intrapleural pressures were recorded during the playing of a wind instrument, the situation is comparable to a modified Valsalva maneuver or the expulsive phase of a cough through a restricted orifice In these instances, Whittenberger and Mead (*Tr Nat Tuberc Assoc*, 1952, p 414) stated that the intrathoracic pressure may increase by well over 100 mm Hg Since the most common cause of spontaneous pneumothorax is the rupture of a subpleural cyst or bleb into the pleural cavity, an increase in intra-alveolar pressure would favor such a rupture

Furthermore, there is evidence that spontaneous pneumothorax may be due to the escape of air from the alveolar spaces into the supporting tissues about the pulmonary vessels Macklin (*Canad Med Ass J 36* 414, 1937) demonstrated this with experimental overinflation of the lung While the restricted orifice would tend to maintain the patency of the bronchial airway and eliminate the possibility of a physiologic check-valve mechanism, the increased intrapulmonary pressure alone may be enough to cause a breakthrough of air by this route The history of two previous episodes of spontaneous pneumothorax points strongly to the presence of congenital cysts of the lung or a structural weakness of the visceral pleura Under these circumstances, any activity which tended to increase the pressure volume dynamics might favor recurrence of pneumothorax

HYLAN A BICKERMAN, M D

ABSTRACTS FROM THE LITERATURE

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Pheochromocytoma —Pheochromocytoma once considered rare, is being reported with increasing frequency The fact that annually 800 people die in the United States from this disease and all could be saved is the stimulus for discussing this entity A typical case (history symptoms, and laboratory data) with surgical management and post-operative care is reported The discussion includes (1) locations of tumors (2) pathology (3) pathological physiology, (4) diagnosis, (5) surgical management stressing control of hypertension and hypotension, and (6) proper anesthesia The following conclusions are reached (1) Pheochromocytoma is more common than was originally thought (2) As a curable disease, failure to diagnose represents great tragedy (3) When this tumor is present and unrecognized, operation for unrelated conditions frequently proves disastrous

Progressive Malignant Degeneration of Cystadenoma of Pancreas —A case which was originally a cystadenoma of the pancreas has been followed for a period of 10 years During this time because of recurrences requiring surgical procedures there has been an opportunity to study the progressive transformation from a noninvasive, benign tumor through stages in which the tumor developed invasive properties The progressive changes have consisted of changes in cytological characteristics of the tumor cells, as well as of growth patterns Thus, the development of papillary processes has been observed, followed by loss of differentiation with lateral invasion of undifferentiated epithelium This study points out the importance of complete eradication of benign cystadenoma of the pancreas if subsequent malignant degeneration is to be avoided

Respiratory Depression with Intraperitoneal Neomycin —Twenty-eight adult male patients, each of whom received 2 Gm of neomycin intraperitoneally during surgery, were compared with 25 controls Both groups had similar anesthetic management Fifteen of the neomycin-treated patients showed varying degrees of respiratory depression, as compared to 3 of the controls Three of the neomycin-treated group exhibited total apnea for periods up to more than 10 hours Six others experienced severe respiratory depression without apnea and the remaining 6 showed mild depression of respiration Of the controls 2 had minimal and 1 had moderate depression Dosage has now been reduced to 1 Gm of 1 per cent solution A continuing study to determine the effects of the reduced dosage is under way To date we have observed no depression in adults receiving this dosage

Treatment of Rattlesnake Bite with Vitamin K as Adjunct —The case report of a 70-year-old white woman who was bitten by a rattlesnake is presented Apparently the venom was injected into the veins at the ankle and the patient developed extensive hemorrhagic tendencies A prothrombin time of over 4 minutes and a platelet count of 45 000 were recorded The patient responded to relatively fresh blood and vitamin K, 50 mg phytonadione (Mephyton) given intravenously, and 57 mg menadiol sodium diphosphate (Synkayvite) given intramuscularly A plea is made for complete evaluation of the coagulogram and of liver and kidney functions immediately and every 8 hours after, a severe rattlesnake bite The species of snake should be reported when possible This will evaluate the rationale of vitamin K and fresh blood as proposed adjuncts in the treatment of diamondback rattlesnake *(Crotalus adamanteus)* bites

Carcinoma of Infrapapillary Portion of Duodenum —Carcinoma of the duodenum is rare, it is found in the suprapapillary and infrapapillary portions Fifteen per cent of

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Titles marked with an asterisk (*) are abstracted

published cases of hypersensitivity to PAS therapy They discuss the information derived from these cases and add relevant facts from 48 new cases Although clinical and laboratory findings differed widely, a large percentage of patients exhibited manifestations which fall within a fairly fixed pattern Fever and involvement of the skin are the most common symptoms With early recognition and proper management, hypersensitivity to PAS produces only slight inconvenience during treatment The appearance of fever of 102° F to 104° F (38 9° C to 40 0° C) in a patient who was previously afebrile, especially if the fever develops during the 4th week of treatment and is preceded by a gradual rise over 2 days, should arouse strong suspicion of hypersensitivity to PAS, particularly if the fever is accompanied by itching or rash Under these circumstances the drug should be discontinued in preference to risking an increase in symptoms and hepatic damage which may be fatal Until PAS therapy becomes less important than it is at present, patients exhibiting hypersensitivity to it should be desensitized This is best accomplished by using a very small initial dose and increasing it gradually

Am J Roentgenol, Springfield, Ill

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Neurogenic Tumors of the Mediastinum —The authors report on 72 males and 68 female patients, 10 to 69 years of age, with extrapleural mediastinal tumors of neurogenic origin, who were treated surgically at the Mayo Clinic between 1923 and 1955 Presenting complaints of these 140 patients were mainly the results of pressure on neighboring structures Eighty-seven patients had Schwannoma and 39 had ganglioneuroma, more than 50% of the patients in these 2 groups were asymptomatic The tumor was first recognized from a routine roentgenogram of the thorax Correct diagnosis of any mediastinal mass can often be made by noting the position of the tumor in the lateral roentgenogram and by determining the presence or absence of movement on swallowing or on pulsation at fluoroscopy Of the 140 patients, 4 (2 9%) died in the immediate postoperative period Of the 87 patients with Schwannoma, 86 (45 females and 41 males) had benign tumors and 1 had a malignant tumor Of the 86 patients, 66 were alive and well at the time of follow-up, 52 had been operated on at least 5 years, and 31 at least 10 years previously Six were alive some 20 years after operation In 5 of the 39 patients with ganglioneuroma, a portion of the tumor was left behind without any apparent untoward effect Four of these patients have been traced for at least 10 years One patient with a neuroblastoma has survived for 11 years since incomplete removal of the tumor without any postoperative radiation therapy Microscopic deposits of calcium were common in tumors of patients with ganglioneuroma, but were discernible roentgenographically as multiple punctate densities in only one patient

Cutis Hyperelastica The author reports on a 35-year-old man with cutis hyperelastica syndrome, first described by Ehlers and Danlos The patient was admitted to the Veterans Administration Hospital, Philadelphia, for a diffusely enlarged and tender left ankle A red, tender nodule was observed on the anterior surface of the left lower leg Roentgenologic examination revealed multiple, small, calcific densities in the soft tissues of both legs and in the right thigh near the greater trochanter of the femur These densities showed a ringlike outer shell with a central relative radiolucence A biopsy of the nodule and the adjacent muscle revealed a hematoma and normal muscle During the next 21 months the patient was readmitted to hospital on 3 occasions, because of subcutaneous hemorrhages, herpes zoster, and an attack of diverticulitis which responded to conservative management Two years after the 1st admission he entered the hospital complaining of severe abdominal pain An exploratory laparotomy revealed severe regional enteritis involving most of the small intestine He had a stormy postoperative course and died 17 days after operation The case of this patient illustrates the combination of typical roentgen findings of multiple, small, subcutaneus nodules of calcific density, seen particularly over the lower extremities unassociated with the usual marked elasticity of the skin The patient's chief complaints were centered around manifestations of blood vessel fragility, while the hyperelasticity of the skin and hyperextensibility of the joints were only subordinate symptoms Probably more cases of this syndrome exist undiagnosed and the incidental roentgen findings may prove a key to correct diagnosis

Familial Mediterranean Fever —Of 80 patients in whom a diagnosis of familial Mediterranean fever was made at the Tel-Hashomer Hospital, Tel-Aviv, Israel, 40 were examined roentgenologically because of one or more manifestations of the disease The examinations were performed during attacks, during the abatement of attacks, and during quiescent intervals Roentgenologic evidence of attacks of familial Mediterranean fever may be found in the abdomen, the thorax, and the joints Distension and fluid levels in the intestine have been seen during acute abdominal attack Chest attacks are accompanied, as a rule, by pleural effusion Its rapid disappearance strengthens the diagnosis of familial Mediterranean fever Awareness of the existence of familial Mediterranean fever is essential in the roentgenologic evaluation of joint attacks Roentgenologic changes showing osteoporosis were observed in the knee, hip, and sacroiliac joints, and were similar to those of rheumatoid arthritis, however, in patients with familial Mediterranean fever the small joints are not involved Tuberculous arthritis may be differentiated by the discrepancy between the roentgen findings and the clinical manifestations

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Primary Aldosteronism—From the Presbyterian Medical Center San Francisco the authors report on 3 patients in whom a diagnosis of mineralocorticoid excess was made and who were operated on The removal from these patients of an adrenal cortical tumor cured them of primary aldosteronism The clinical symptoms included headache thirst, polyuria and weakness lassitude and periodic paralysis The clinical signs were hypertension and occasionally signs of muscular irritability and weakness, such as positive Chvostek and Trousseau signs The association of hypertension and hypopotassemia strongly suggests the diagnosis of mineralocorticoid excess Confirming evidence is found in the dilute urine with increased ammonia excretion, low titratable acidity and neutral pH The sweat and salivary sodium content is low the potassium content is high Body potassium deficiency as revealed by potassium loading and the renal response to a low sodium diet namely, no loss of sodium in the urine and body potassium repletion, are reliable diagnostic tests they are far simpler than the measurement of urinary aldosterone at present Preoperative management included potassium repletion by a high potassium diet The transabdominal surgical approach is advised so that both adrenals may be inspected simultaneously If a tumor is found, it should be removed If hyperplasia is found total adrenalectomy should be performed on the right side and subtotal adrenalectomy on the left side

Management of Injuries to Major Veins—The authors report on 46 men and 5 women with an average age of 29 years who were treated over a 10-year period at the Los Angeles County General Hospital Los Angeles, for 52 major venous injuries Sharp instruments accounted for 23 of these injuries missiles caused 20, and blunt instruments accounted for 9 more The vein most frequently injured (9 times) was the superficial femoral the internal jugular vein and the inferior vena cava were each involved 8 times The brachial vein was injured in 7 cases, but the axillary only once The popliteal vein was involved in 4 cases Forty-one (80%) of the 51 patients survived with good results The profound shock which frequently occurs with venous injury must be combated by prompt surgery to control the bleeding site This necessitates an aggressive approach to the vessels involved whether they are in the neck chest abdomen or extremities Lateral suture repair is preferred to ligation Postoperative anticoagulants are of little value and postoperative thrombophlebitis is not a major problem after repair or ligation Grafts to bridge venous defects are not advocated There were 10 deaths (mortality, 19 6%) 4 in patients who were not operated on and a 5th from bleeding at the site of an improperly controlled laceration of the vena cava Eight arteriovenous fistulas occurred in patients who were not operated on Prompt surgery might have prevented this disturbing sequela When major veins are injured they must be repaired promptly to control bleeding avoid arteriovenous fistulas, and prevent death

Abdominal Aortic Aneurysms—The author reports on 38 patients with intact aneurysms of the abdominal aorta and on 35 patients with ruptured aneurysms of the abdominal aorta who were seen at the Vancouver General Hospital, British Columbia, between 1955 and 1959 The ages of the 73 patients varied from 51 to 84 years and the ratio of men to women was 7 to 1 The symptoms of the patients with intact aneurysms were predominantly pain and, to a lesser degree, an abdominal mass Ruptured aneurysms caused a general systemic reaction and, in addition, local symptoms related to the direction of rupture and hematoma dissection The abdominal route was used for surgical procedure in all patients, with completely satisfactory results Useful adjuncts proved to be an aortic compressor to obtain proximal control when necessary and hypothermia which is thought to be helpful with respect to shock and postoperative renal function The replacement materials used were homografts in the first half of the series and synthetic material (with a preference for woven Teflon) in the last half of the series The results of surgical treatment indicate a decreasing mortality in both groups of patients, 18% for those with intact aneurysms and 50% for those with ruptured aneurysms It would seem that the search of the centuries for the ideal operation for aneurysms may be at an end It is evident however, that only too rarely does one see this condition in the ideal patient Herein lies the main challenge of the present day surgical treatment of aneurysms

Hypertension Caused by Hyperplasia of Renal Arteries—The authors report on 3 women, 35 to 37 years of age, who were admitted to the University of California Hospital San Francisco and in whom reversible hypertension was produced by the stenosing effect of fibromuscular infiltration of one or both renal arteries Hypertension had first occurred in each as a complication of previous pregnancies Blood pressure was restored to normal in each patient by either renal artery reconstruction or nephrectomy The pathological changes in all 3 presented striking similarities Histological changes were confined to the renal arteries and their primary branches proximal to their entrance into the kidney Hypertrophy of the media produced irregular, and often extreme narrowing of the arterial lumen, van Gieson stains showed that this hypertrophy primarily involved the muscular tissue There were additional focal areas of medial thinning, disruption of both internal and external elastic membranes and aneurysmal dilatation of the arterial wall The intimal changes were limited to occasional areas of cellular proliferation producing minimal focal thickening which was usually localized to an area adjacent to an aneurysm These pathological abnormalities observed in the renal arteries appear strikingly dissimilar to those found in patients with atherosclerosis, thromboangiitis obliterans or the collagen diseases Significant findings in the renal tissue of all 3 patients were limited to the minimal nephrosclerotic changes characteristically observed in patients with hypertension In six additional cases recorded in the literature fibromuscular hyperplasia of the renal artery was the cause of renal arterial stenosis and secondary hypertension

The Mallory-Weiss Syndrome—The authors report on 2 men aged 33 and 83 years who were admitted to hospital in Oakland, California because the younger patient was vomiting large amounts of blood and the older patient complained of nausea and vomiting of coffee-ground material Both patients were operated on and the preoperative diagnosis of lacerations of the stomach secondary to vomiting was confirmed at surgical intervention Treatment consisted of simple transfixion of a bleeding artery in one of the lacera-

Klinicheskaya meditsina, Moscow

38 1-160 (July) 1960 Partial Index

°Resistance of Diabetic Patients to Sulfanilamides
E G Moskovich p 44
Polyclinic Treatment with Sulfanilamides
L N Pesikova p 51
Diabetes Mellitus and Chemotherapeutic Agents
Y M Grinberg M V Kramova, and V N Fetisov p 56
°Functional State of Liver and Pancreas in Thyrotoxicosis
T I Dobrovolskaya p 65

Resistance of Diabetic Patients to Sulfanilamides —Moskovich reports on 344 patients who were given, perorally, antidiabetic sulfanilamide preparations Change from insulin therapy to treatment with sulfanilamides in all cases was effected gradually, with obligatory maintenance of the diet The dose was chosen for each individual patient The development of late resistance was observed in 26 patients (7 5%), which is in conformity with literature data Late resistance was revealed at different periods, ranging from 2 months to 2 years, irrespective of the duration and severity of the disease and of the quantity of insulin given In the overwhelming majority of patients resistance to sulfanilamides was stable, whereas in others resistance was re-established following the administration of insulin When late resistance was detected, insulin was usually administered in a higher dose than previously The mechanism of development of late resistance is obscure

Liver and Pancreas in Thyrotoxicosis —The author carried out complex examinations of 80 patients with marked thyrotoxicosis, including studies of the functional condition of the liver and pancreas Along with the development of thyrotoxic hepatitis, in a number of cases there was partial impairment of the liver function Disturbances of the protein-forming and pigment functions of the liver, as well as of the carbohydrate metabolism, were the most marked and constant In derangement of the latter, affection of the pancreas plays a definite role Investigation of the secretory function of the pancreas, after the Staub-Traugott method, disclosed insulin insufficiency of varying degree in 65 patients, in a number of cases the glycemic curves were of diabetic nature Simultaneous assessment of the external secretory function of the pancreas also revealed a drop in the fermentative activity and the rapid exhaustion of the external secretion Thus, simultaneous studies of the functional state of the liver and pancreas in patients with thyrotoxicosis made it possible to establish a mutual involvement of these organs in the pathological process

Medical Journal of Australia, Sydney

2 41-80 (July 9) 1960 Partial Index

Evaluation of Oral Medication in Children
B W Gunner p 47
°Liver Failure in Late Pregnancy
G Crawford and others p 49

Liver Failure in Late Pregnancy —Hyperuricacidemia was an early sign of liver failure in 3 women with twin pregnancy The clinical picture, which developed at about the 34th week of pregnancy in all 3 patients consisted of a short history of anorexia, preeclampsia, nausea and vomiting, with tenderness over the liver In 2 of the patients symptoms and signs of hepatic coma developed, leading to death in 1 The final stage of illness in this latter patient clearly demonstrated acute massive necrosis of the liver, with the clinical features of acute liver failure Evidence was produced in all 3 patients that nutritional deficiency was an important factor in the etiology of this condition It is suggested that there was a breakdown in the enzymatic processes precipitated by poor nutrition and the additional fetal requirements in the 3rd trimester of pregnancy While in patients with single pregnancy and preeclampsia the routine estimation of serum uric acid levels may not be justified, it seems to be imperative in those with twin pregnancy and/or nutritional deficiency The presence of such a condition demands immediate termination of pregnancy before irreversible damage occurs in the liver

Nederlands tijdschrift v geneeskunde, Amsterdam

104 1273-1312 (July 2) 1960 Partial Index

°Epidemic of Infectious Hepatitis Use of Gamma Globulin—G J Bos p 1278
Schilling s Test in Patients with Pernicious Anemia
E Sangster and W Schopman p 1283

Infectious Hepatitis Use of Gamma Globulin —The author describes the first appearance of an epidemic of infectious hepatitis during 1958 in the practice of a physician in a town of about 30,000 in the Netherlands First a 5-year-old boy in one family became jaundiced, and in the succeeding months 4 older children in the same family showed such signs of infectious hepatitis as gastrointestinal symptoms, jaundice, urine the color of Coca-Cola, and enlargement of the liver The author recalls observations in epidemics of infectious hepatitis that occurred in the Netherlands between 1952 and 1954, but suggests that the causative agent of the 1958 outbreak was not necessarily the same as that of the earlier outbreaks When other cases of infectious jaundice appeared, gamma globulin was administered to family contacts, since this had been found effective in an earlier epidemic of infectious hepatitis by another investigator It was observed that administration of gamma globulin to family contacts of patients resulted in a striking reduction of secondary cases of infectious hepatitis, particularly among children This method is deemed advisable as a routine procedure in general practice

Neurology, Minneapolis

10 623-716 (July) 1960 Partial Index

Determinations of Retinal and Carotid Artery Pressures—G T Tindall and others p 623
Permeability of Cerebral Vessels to Albumin
R Rozdilsky and J Olszewski p 631
Headache in Childhood
W A Froelich and others p 639
°Guillain-Barre Syndrome from Tetanus Antitoxin
A W Miglets and others p 658

Guillain-Barre Syndrome from Tetanus Antitoxin —The authors report on a 37-year-old housewife who ran a rusty nail into her left hand and was given 0 5 cc of undiluted tetanus antitoxin after a skin test revealed only a suggestion of erythema Seven days later she was admitted to the South Unit of the Youngstown Hospital Association, Ohio, for a syndrome of polyradiculoneuritis with albuminocytological dissociation (Guillain-Barré syndrome) Detailed serologic studies were carried out and revealed hemagglutinins to horse serum in a titer of 1 32,000 The antibodies persisted for at least 222 days The presence of hemagglutinins against horse serum in such an extremely high titer would suggest that hypersensitivity to horse serum played a role in the pathogenesis of Guillain-Barre syndrome in this patient She is believed to be the 2nd patient with Guillain-Barre syndrome resulting from tetanus antitoxin injection in whom serologic studies were carried out which suggested a hyperimmune response to horse serum as the causative agent

New England Journal of Medicine, Boston

263 153 206 (July 28) 1960 Partial Index

*Studies on Attenuated Measles-Virus Vaccine I
J F Enders and others p 153
*II Effects of Measles-Virus Vaccine in Children
S L Katz and others p 159
III Effects of Measles-Virus Vaccine in Children
C H Kempe and others p 162
IV Administration of Vaccine by Several Routes
F L Black and S R Sheridan p 165
V Prophylactic Effects of Vaccine in Children
M L Lepow and others p 170
VI Prophylactic Effects of Vaccine in Children
S Krugman and others p 174
VII Prophylactic Effects of Vaccine in Children
R J Haggerty and others p 178
VIII Summary and Evaluation of Vaccination Results
S L Katz and others p 180

Studies on Attenuated Measles-Virus Vaccine I—The authors recapitulate the steps in the development of an avianized attenuated measles virus It is shown that this agent is distinguished from the virus of origin by the following properties capacity to multiply and to induce cytopathic effects in chick-cell systems incapacity to produce overt disease or consistently recognizable viremia in susceptible monkeys and incapacity to multiply freely in the central nervous system of these animals or to establish itself in the upper respiratory tract after intracerebral inoculation Antigenicity of the attenuated strain, however was completely retained After inoculation of monkeys by any of the parenteral routes selected, complement-fixing and virus neutralizing antibodies appeared in high concentration between the 15th and the 23rd day and tended to persist for protracted periods at lower levels These properties suggested that this virus might provide a means of safely and effectively inducing active immunity in man Vaccines were therefore prepared consisting of the fluid from infected chick-embryo cell cultures maintained with a medium of known chemical composition The mode of preparation of these vaccines which were employed in the trials in children to be described in the following communications is presented in detail

Effects of Measles-Virus Vaccine in Children—The authors carried out the first vaccination trial employing attenuated measles virus propagated in cultures of chick-embryo cells in 10 boys and 3 girls 2½ to 10 years of age, in a state school for the mentally deficient in a suburb of Boston These children satisfied the 3 criteria a negative history for measles, absence of measles complement-fixing antibodies in the serum, and written consent of parents or guardians Eleven of the group were inoculated subcutaneously with 0 2 cc each of vaccine, the remaining 2 were similarly inoculated, but as controls, with 0 2 cc of sterile tissue culture medium Over the succeeding 21 days temperatures were recorded by rectum 4 times per day, and each child was examined daily by one of the authors Local reactions to vaccination were not detected in any of the 13 children No signs or symptoms of illness resembling measles appeared in either of the 2 controls Of the 11 children who received live virus vaccine, 8 showed temperature elevations of 100 F (37 8 C) by rectum or higher beginning 6 to 9 days after the inoculation and lasting 2 to 5 days A rash that appeared after defervescence and persisted for 1 to 3 days was detected in 9 children Koplik spots were found in only one child The most striking clinical phenomenon was the absence of disability during the time of fever and rash Especially noteworthy was the absence of signs or symptoms of respiratory-tract involvement Attempts to isolate the virus from throat swabs and venous blood specimens failed By the 15th day 8 children, and by the 22nd day all 11 vaccinated children had developed antibody concentrations comparable to those observed in patients recently convalescent from naturally acquired measles The 2 controls remained serologically negative, and have persisted so over the subsequent 18 months

Pediatrics, Springfield, Ill

26 1-174 (July) 1960 Partial Index

*Treatment of Phenylketonuria with Diets Low in Phenylalanine—W E Knox p 1
*Enterovirus Infection in Epidemic of ECHO 9 Infection
M L Lepow D H Carver and F C Robbins p 12
Obstructive Jaundice of Infancy Surgical Exploration
T V Santulli R C Harris and K Reemtsma p 27
Temporary Gastrostomy in Pediatric Surgery
T M Holder and R E Gross p 36
Pulmonary Hyaline Membrane and Factors in Pregnancy and Delivery—M M Cohen and others p 42
Protein from Human and Cow s Milk in Nitrogen Retention
S J Fomon p 51
Vitamin B_6 Dependency and Infantile Convulsions
C R Scriver p 62
Renal Tubular Dysfunction and Nephrotic Syndrome
G B Stickler and others p 75
Endocardial Fibroelastosis with Glycogenosis
R A Wilson and N Clark p 86
Prognosis of Infants Born of Tuberculous Mothers
E L Kendig Jr p 97
Myasthenia Gravis in the Newborn
M Greer and M Schotland p 101
*Coarctation of Aorta in Infants
I H Glass W T Mustard and J D Keith p 109

Phenylketonuria and Diets Low in Phenylalanine—While the beneficial effect of a diet low in phenylalanine on the biochemical abnormalities of phenylketonuria is established, its effect on mental deficiency in this disease is uncertain Reports of cases of phenylketonuria treated with a low phenylalanine diet, published up to December, 1959, were reviewed, untreated patients with phenylketonuria with an I Q above 60 were tabulated Among 466 untreated patients 2 5% had an I Q above 60 This figure served as one basis for the evaluation of treatment Forty-four patients, over 3 years of age, have been treated, without impressive change in mental or neurological status These were not considered further Forty-three patients, treated before 3 years of age were evaluated in detail The mean age at start of treatment was 16 2 months, and the mean duration of treatment was 16 8 months In the treated group there were 18 times as many with an I Q above 60 and twice as many with a normal electroencephalogram as in the untreated group, they also had fewer seizures Of those treated before 16 months of age compared with those treated between 16 months and 3 years of age there were 4 times as many with an I Q above 60 and none with seizures, there were also more with normal electroencephalograms In the whole group the I Q was inversely related to age at the start of treatment A minimal loss of nearly 5 points in the I Q occurred for each 10 weeks that treatment was delayed The low phenylalanine diet, started in the early months of life, is effective as a preventive of mental deficiency and neurologic abnormalities The diet is less effective in reversing changes

Enterovirus Infection in Epidemic of ECHO 9 Infection—Since 1954 numerous outbreaks have been reported of an illness, characterized by aseptic meningitis, which in some instances was associated with a rubella-like rash The virus responsible for the majority of these outbreaks has been identified as ECHO 9 virus and has been isolated from cerebrospinal fluids, feces, throat washings, and the blood of ill persons The present investigation was undertaken in order to learn more about the epidemiology of ECHO 9 virus infection, and clinical, epidemiologic, and laboratory studies were carried out during an epidemic which occurred in a housing development Clinical signs varied with age Young children exhibited exanthem, whereas older persons frequently had evidence of irritation of the central nervous system Multiple cases occurred within families, with the incidence of illness highest in the younger age groups No serious consequences of the illness were seen ECHO 9 virus was recovered with greater frequency from the intestinal content of young patients than from that of adults, although the latter had serologic evidence of recent infection The rate of inapparent infection with ECHO 9 virus was low Virus rarely persisted in the feces beyond 14 days after onset of illness Group B Coxsackie viruses, type 4 and type 5, were found also to cause infections within the same population at the same time and similar to those due to ECHO 9 virus, except that no eruption was observed The rate of inapparent infection was higher than that observed with ECHO 9 virus Simultaneous infection with ECHO 9 virus and Coxsackie B_4 or B virus was rare

Coarctation of Aorta in Infants—The authors review observations on 108 infants less than 1 year old, in whom coarctation of the aorta was diagnosed, and who were admitted to the Hospital for Sick Children, Toronto, over a 12-year-period Preductal coarctation caused 90% of the fatalities in this series Patency of the ductus arteriosus occurred in 98% of infants less than 6 months old Other major cardiac anomalies such as ventricular septal defect, transposition of the great vessels, or atrial septal defect occurred in 49% of the less-than-1-year-old infants with coarctation of the aorta Diagnosis proved difficult when blood pressure readings were equivocal Throughout the 1st year of life surgical mortality of operations for coarctation of the aorta was 41%, while after 1 month of age it was only 29% Mortality in patients not operated on during the first year of life was 50%, for those less than 1 month old, with symptoms and signs of decompensation and not operated on, mortality was 87% The authors make the following recommendations for dealing with coarctation of the aorta during the 1st year of life (1) When blood pressure readings in the arms and legs are equivocal the readings should be repeated frequently until the diagnosis is clarified (2) Aortography should be performed when diagnosis proves difficult (3) Babies presenting with symptoms in the 1st month of life should be operated on promptly unless they show a dramatic response in a 12-hour trial of digitalis (4) Babies over 1 month of age who respond to digitalis may be kept on this medication until adequate adjustment in circulatory hemodynamics has taken place and surgery can be performed at the optimum age

Schweizerische medizinische Wochenschrift, Basel

90 719-742 (July 2) 1960 Partial Index

Coronary Insufficiency Electroencephalographic Pattern—M Holzmann p 719
*Water-Soluble Vitamins in Excessive Doses T Gordonoff p 726
Osmotic Resistance of Erythrocytes in Sensitization A Ribi and others p 729

Water-Soluble Vitamins in Excessive Doses—The author describes experiments which demonstrated that when guinea pigs are given large doses of vitamin C and are then put on a scurvy-inducing diet together with sister animals that have not been pretreated with large doses of vitamin C, the scurvy is more severe and more readily fatal in the pretreated than in the other animals In studying the elimination of vitamin C in the test animals, it was found that in the pretreated animals the excretion of vitamin C is greatly inhibited as soon as they are given a scurvy-inducing diet It appears that there is a vitamin C regulatory mechanism designed to protect the body against loss It is therefore regarded as inadvisable to administer large doses of vitamin C for long periods

Scottish Medical Journal, Glasgow

5 279-322 (July) 1960 Partial Index

Wound Healing and Wound Care A B Wallace p 279
*Atrial Septal Defect J M Reid p 290
Portal Cirrhosis in South-West Scotland S G McAlpine p 298
Ophthalmoplegia with Ptosis J C Holden p 306

Atrial Septal Defect—The author reports on 34 patients admitted to Mearnskirk Hospital, Renfrewshire, Scotland, with atrial septal defects, 24 of which were of the secundum type and 2 were of the primum type Of the remaining 8 patients, 4 had partial anomalous pulmonary venous drainage associated with an atrial septal defect and 4 had total anomalous pulmonary venous drainage and atrial septal defects One additional patient had partial anomalous pulmonary venous drainage without an associated atrial septal defect Twenty-three of the 24 patients with secundum type septal defect were operated on with the aid of hypothermia Circulatory arrest was produced by occluding both venae cavae, the aorta, and the pulmonary artery for an average of 6 minutes, a period that was found adequate for complete repair of the defect by continuous suture In all patients, operation resulted in closing of the heart sounds and decrease in the prominence of the pulmonary conus and the cardiac size Surgical repair has not yet been performed in the 2 men with atrial septal defects of primum type The 4 patients with partial anomalous pulmonary venous drainage accompanying an atrial septal defect, and the additional patient without accompanying septal defect were treated surgically Two of the 4 patients died, the 2 others and the patient without septal defect recovered Of the 4 patients with complete anomalous venous drainage, 2 were infants, who died before an operation could be performed In the 3rd patient, irreversible ventricular fibrillation occurred in the course of the operation before any definite measures could be undertaken The 4th patient died of acute left ventricular failure during the rewarming Extracorporeal circulation is essential in repair of this anomaly